



# Illinois Department of Transportation

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To: Anthony J. Quigley      Attn: John Baczek  
From: Jack Elston      By: Michael Brand *moB*  
Subject: Pavement Design Approval  
Date: March 15, 2018

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Route: US 20      Job No.: D-91-003-17  
Section: 2016-092B&R      Contract No.: 62D36  
County: McHenry      Target Letting: Sept. 2018  
Limits: Marengo Road to W. Union Road

We have reviewed the pavement design for the above referenced project which was submitted on January 19, 2018. The scope of the project involves reconstruction of the three intersections involving US 20, Beck Road, Marengo Road and S. Union Road into a single five-legged roundabout; reconstruction of US 20 to replace a box culvert; and widening/resurfacing of US 20 at the Coral Road and W. Union Road intersections to provide additional channelization.

Reconstruction of US 20: This part of the design resulted in two pavement options: 10.25" PCC and 11.5" Full-Depth HMA. The life-cycle cost analysis of these options resulted in the HMA being 17.4% less expensive (\$88,516 per mile compared to PCC at \$103,946 per mile) and thus the preferred option.

Reconstruction of Beck Road and Marengo Road: This part of the design resulted in two pavement options: 9" PCC and 9.75" Full-Depth HMA. The life-cycle cost analysis of these options resulted in the HMA being 18.5% less expensive (\$91,784 per mile compared to PCC at \$108,719 per mile) and thus the preferred option.

Widening/Resurfacing of US 20: This part of the design explored several widening options and analyzed them based upon first costs which resulted in the mechanistic HMA design being the preferred option.

In summary, the approved pavement designs are as follows:

US 20 Reconstruction

11.5" Full-Depth HMA  
PCC Curb & Gutter  
12" Agg. Subgrade Improvement

US 20 Widening/Resurfacing

11.5" Full-Depth HMA  
HMA Shoulders  
12" Agg. Subgrade Improvement

Beck Road and Marengo Road Reconstruction

9.75" Full-Depth HMA

HMA Shoulders

12" Agg. Subgrade Improvement

If you have any questions, please contact Michael Brand at (217) 782-7651.



# Illinois Department of Transportation

## Memorandum

To: Jack Elston

Attn: Michael Brand

From: Jose A. Dominguez

By: Ojas Patel

Subject: Pavement Analysis\*

Date: January 19, 2018

\*Route: US Route 20

County: McHenry

Limits: Marengo Road to S Union Road

Contract No.: 62D36

Section: 2016-092B&R

Job No.: D-91-003-17

Current target: 09CY18

We have completed the pavement analysis for the above captioned location. Review by the Central Office is required since the total pavement area for reconstruction exceeds 4,750 Square Yards. The following is the scope of the project:

***Reconstruction of the existing three intersections of US 20 at Marengo Road/Beck Road/South Union Road and US 20 at South Union Road into one five-legged roundabout intersection. Reconstruction of US 20 due to replacement of an existing box culvert. Widening and resurfacing of US 20 at Coral Road and at West Union Road to provide additional channelization.***

A 20-year pavement analysis was performed for the above segments. For reconstruction portions, we recommend a mechanistic flexible pavement design for US 20 and Marengo Road/Beck Road based on the life cycle cost analysis which favors HMA pavement by 17.4% and 18.5%, respectively. For widening portions, we recommend a mechanistic flexible pavement design for US 20 at the intersections of Coral Road and at West Union Road based on a first cost analysis. The recommended pavement is as follows:

### **US 20 at Marengo Road/South Union Road/Beck Road Roundabout<sup>9</sup>**

#### **US 20 at Culvert**

##### **Reconstruction**

HMA Shoulder/PCC Curb and Gutter

11 ½" Full Depth HMA<sup>8</sup>

2" Polymerized HMA Surface Course, Mix "E", N70<sup>1</sup>

2 ¼" Polymerized HMA Binder Course, IL-19.0, N90<sup>2</sup>

7 ¼" HMA Binder Course, IL 19.0, N90<sup>3</sup>

12" Aggregate Subgrade Improvement<sup>7</sup>

**Marengo Road/Beck Road<sup>9</sup>**

Reconstruction

HMA Shoulder

- 9 ¾" Full Depth HMA<sup>8</sup>
- 2" HMA Surface Course, Mix "E", N70<sup>1</sup>
- 7 ¾" HMA Binder Course, IL 19.0, N70<sup>4</sup>
- 12" Aggregate Subgrade Improvement<sup>7</sup>

**US 20 at Coral Road<sup>9</sup>**

**US 20 at West Union Road<sup>9</sup>**

Widening

HMA Shoulder

- 11 ½" Full Depth HMA<sup>8</sup>
- 1 ¾" Polymerized HMA Surface Course, Mix "E", N70<sup>1</sup>
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50<sup>5</sup>
- 9" HMA Binder Course, IL 19.0, N90<sup>6</sup>
- 12" Aggregate Subgrade Improvement<sup>7</sup>

**Pavement Resurfacing<sup>8</sup>**

Cold Milling of Existing HMA Pavement

2 ½" Minimum (more if necessary)

- 1 ¾" Polymerized HMA Surface Course, Mix "E", N70<sup>1</sup>
- ¾" Polymerized Leveling Binder (Machine Method), IL-4.75, N50<sup>5</sup>

<sup>1</sup> Designer Note 1: Use pay item 40603565, **POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "E", N70** paid for in tons.

<sup>2</sup> Designer Note 2: Use pay item 40603240, **POLYMERIZED HMA BINDER COURSE, IL-19.0, N90** paid for in tons.

<sup>3</sup> Designer Note 3: Use pay item 35501313, **HOT-MIX ASPHALT BASE COURSE, 7 ¼"**, paid for in square yards.

<sup>4</sup> Designer Note 4: Use pay item 35501315, **HOT-MIX ASPHALT BASE COURSE, 7 ¾"**, paid for in square yards.

<sup>5</sup> Designer Note 5: Use pay item 40600827, **POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75, N50** paid for in tons.

J. Elston  
January 19, 2018  
Page Three

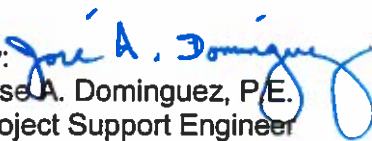
<sup>6</sup>Designer Note 6: For widening of six feet or less use pay item **35600712, Hot-Mix Asphalt Base Course Widening, 9"**, paid for in square yards. For widening of greater than six feet use pay item **35501320, Hot-Mix Asphalt Base Course, 9"**, paid for in square yards.

<sup>7</sup>Designer Note 7: Use pay item **30300112, AGGREGATE SUBGRADE IMPROVEMENT, 12"**, paid in square yards.

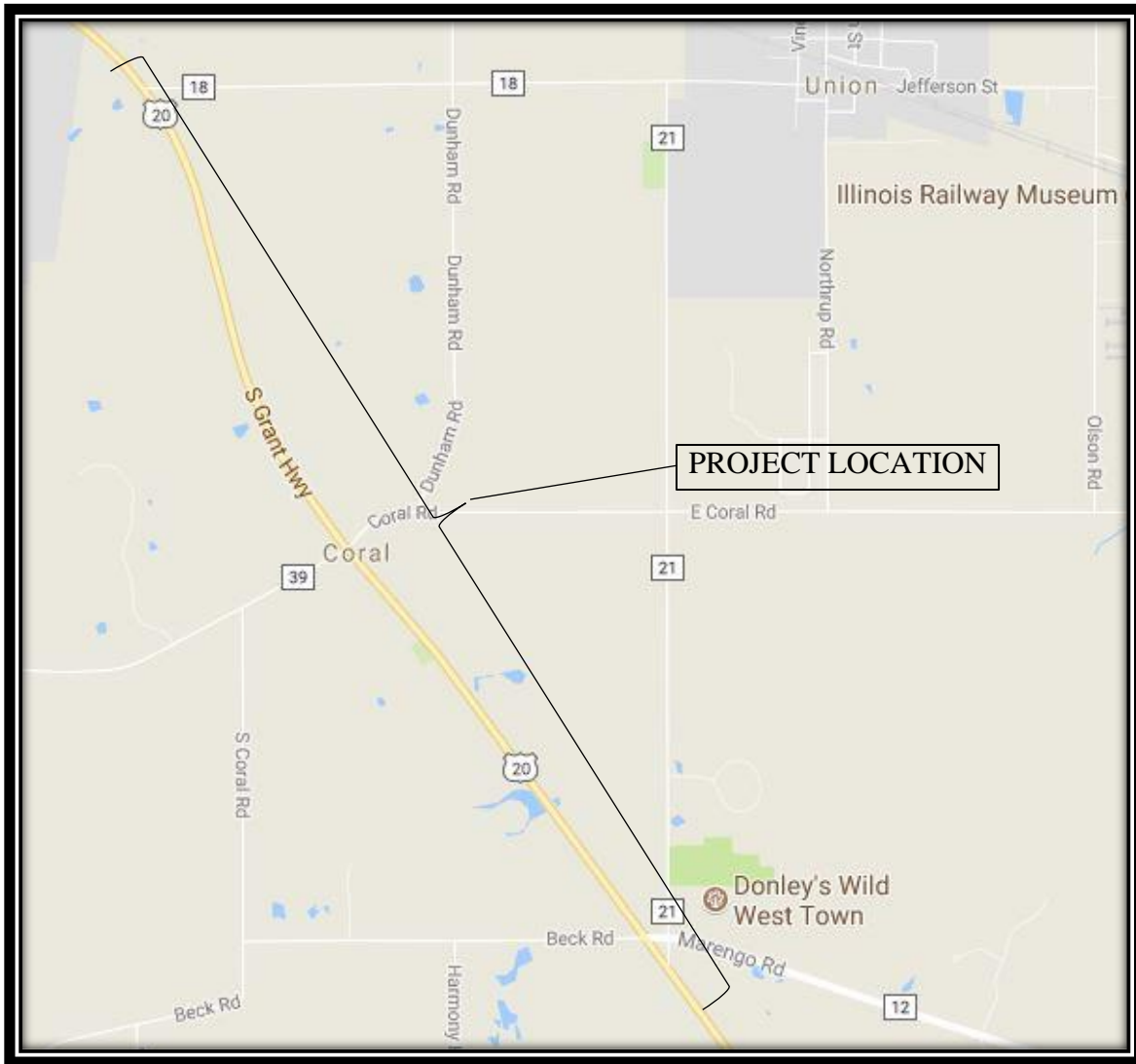
<sup>8</sup>Designer Note 8: Refer to the District One, Bureau of Materials' "Hot-Mix Asphalt – Mix Selection" tables to determine the corresponding HMA mix table requirements for the plans.

<sup>9</sup>Designer Note 9: Marengo Road, Beck Road, South Union Road, Coral Road, West Union Road are subject to local jurisdictional approval and concurrence.

If you have any questions or need additional information, please contact Ojas Patel, Pavement Design Engineer, at (847)705-4550.

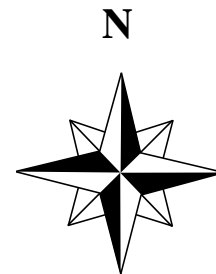
By:   
Jose A. Dominguez, P.E.  
Project Support Engineer

# LOCATION MAP

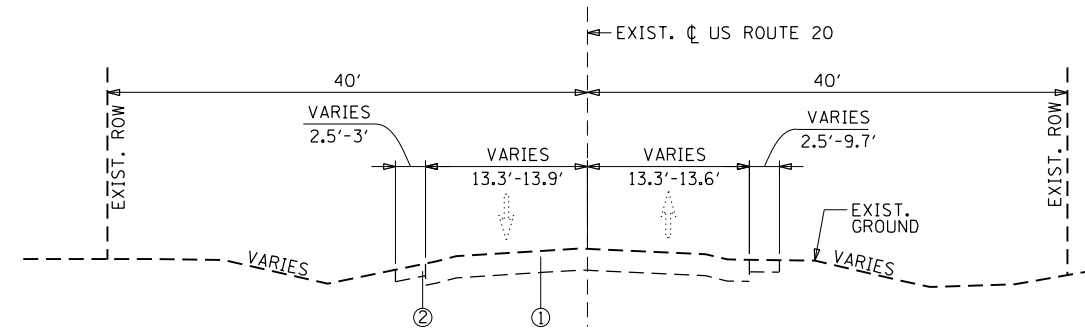


**Route:** US 20 (S Grant Hwy)  
**Limits:** Marengo Rd to W Union Rd  
**County:** McHenry

**D-91-003-17**



**Preliminary  
Subject to Change**

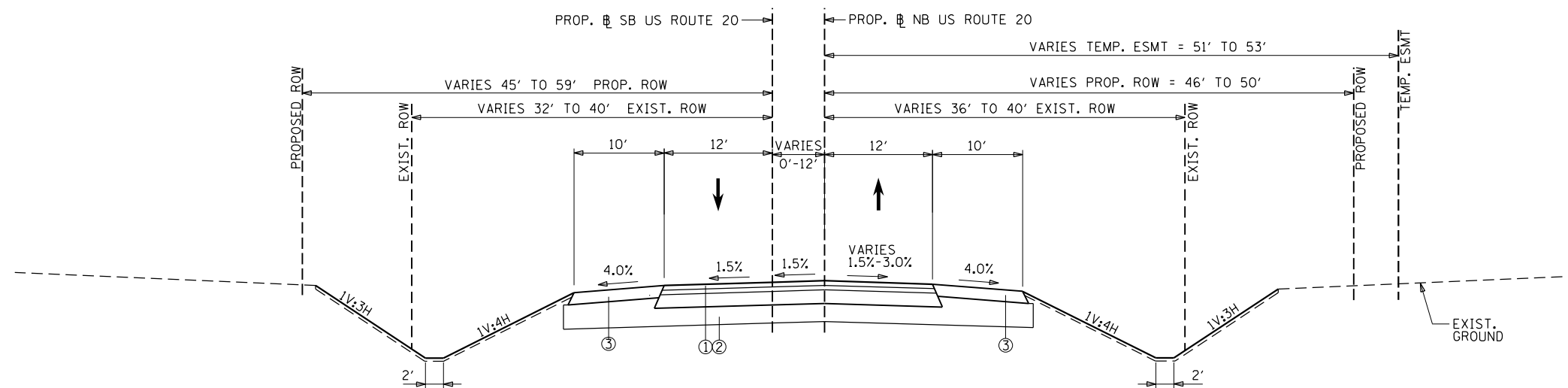


EXISTING US ROUTE 20

STA. 493+50.00 TO 504+37.81\*

•EXISTING CROSS SECTION STATIONS ARE NOT THE SAME AS PROPOSED CROSS SECTION STATIONS

- ① HMA PAVEMENT  
② AGGREGATE SHOULDER



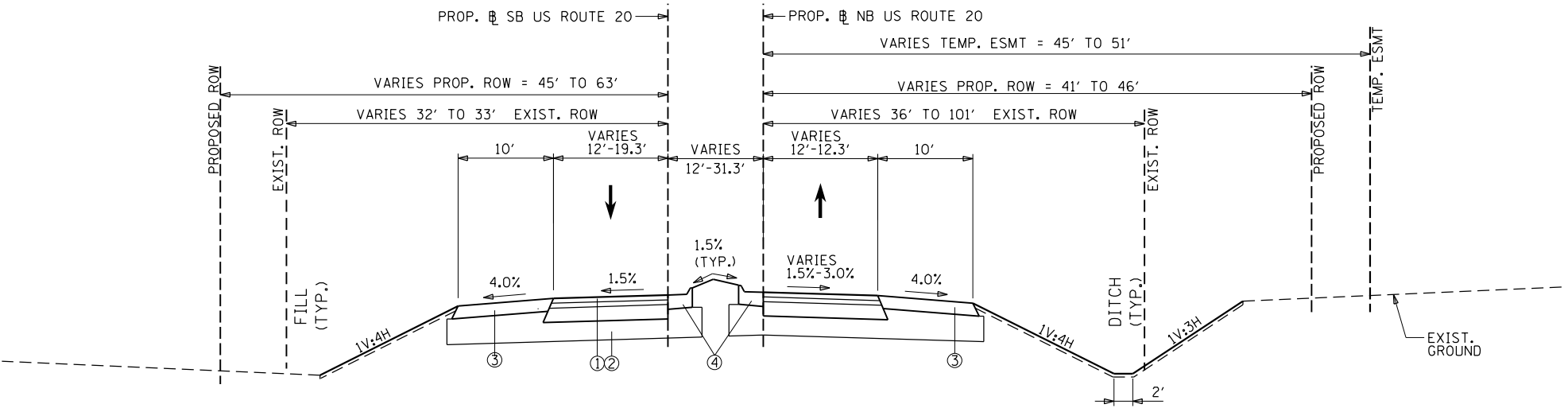
PROPOSED US ROUTE 20

STA. 200+20.56'NB' TO 204+01.92'NB'

- ① 12 1/4" FULL DEPTH HMA PAVEMENT      ③ HMA SHOULDER  
② 12" AGGREGATE SUBGRADE IMPROVEMENT

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PLOT SCALE = 16.0000' / 1in.	CHECKED - JJM	REVISED -					CONTRACT NO. 60T26				
PLOT DATE = 2/18/2016	DATE - 6/01/15	REVISED -		SCALE: N.T.S.	SHEET NO. 1 OF 10 SHEETS	STA. TO STA.	ILLINOIS FED. AID PROJECT				

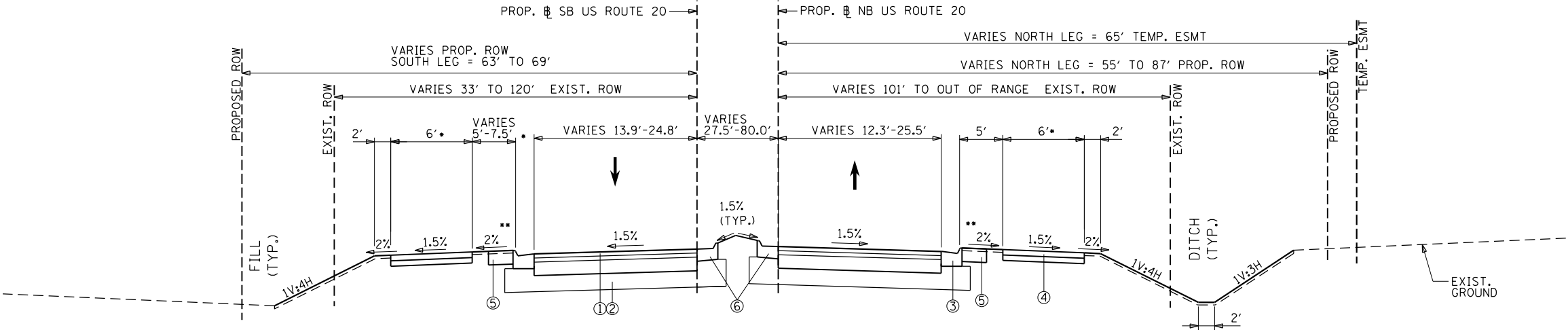
Preliminary  
Subject to Change



PROPOSED US ROUTE 20

STA. 204+01.92'NB' TO 206+05.91'NB'

- ① 12 1/4" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ HMA SHOULDER
- ④ MODIFIED M-4,24 PCC CURB & GUTTER (PITCHED OUTWARD)



PROPOSED US ROUTE 20

STA. 206+05.91'NB' TO 207+50.57'NB'  
STA. 701+15.11'NB' TO 702+28.88'NB'

•M4,24 CURB & GUTTER BEGINS AT  
STA. 206+51.60'NB' LEFT SIDE  
SIDEWALK BEGINS AT  
STA. 206+89.40'NB' LEFT SIDE  
SIDEWALK ENDS AT  
STA. 702+77.36'NB' LEFT SIDE  
M4,24 CURB & GUTTER ENDS AT  
STA. 703+21.74'NB' LEFT SIDE

- ① 12 1/4" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ M-4,24 PCC CURB & GUTTER
- ④ SIDEWALK - 5" CONCRETE SIDEWALK W/AGG. BASE COURSE
- ⑤ 8" COLORED CONCRETE MEDIAN SURFACE
- ⑥ MODIFIED M-4,24 PCC CURB & GUTTER (PITCHED OUTWARD)

•SIDEWALK BEGINS AT  
STA. 206+45.29'NB' RIGHT SIDE  
SIDEWALK ENDS AT  
STA. 701+84.73'NB' RIGHT SIDE  
•• COLORED CONCRETE MEDIAN SURFACE (2' TO 7' WIDTH)  
STA. 206+58.17'NB' TO STA. 207+58.07'NB' RIGHT SIDE  
STA. 701+15.11'NB' TO STA. 701+11.00'NB' LEFT SIDE

Exhibit E-2

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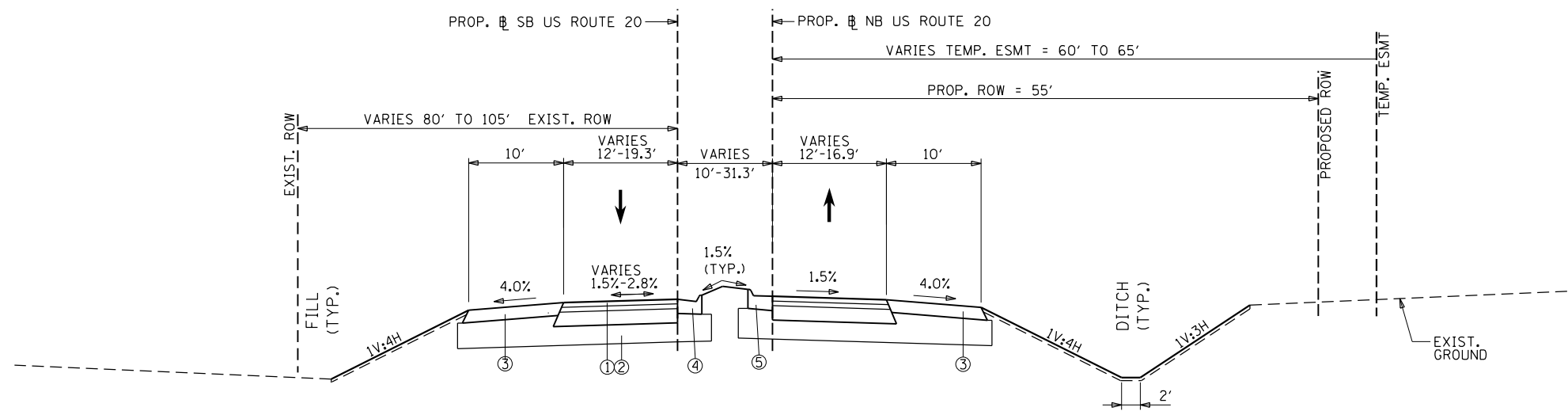
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

US ROUTE 20 AT MARENGO/BECK ROAD TYPICAL SECTIONS - US ROUTE 20		
SCALE: N.T.S	SHEET NO. 2 OF 10 SHEETS	STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
525		MCHENRY	10	2
CONTRACT NO. 60T26				
ILLINOIS FED. AID PROJECT				



Preliminary  
Subject to Change



PROPOSED US ROUTE 20

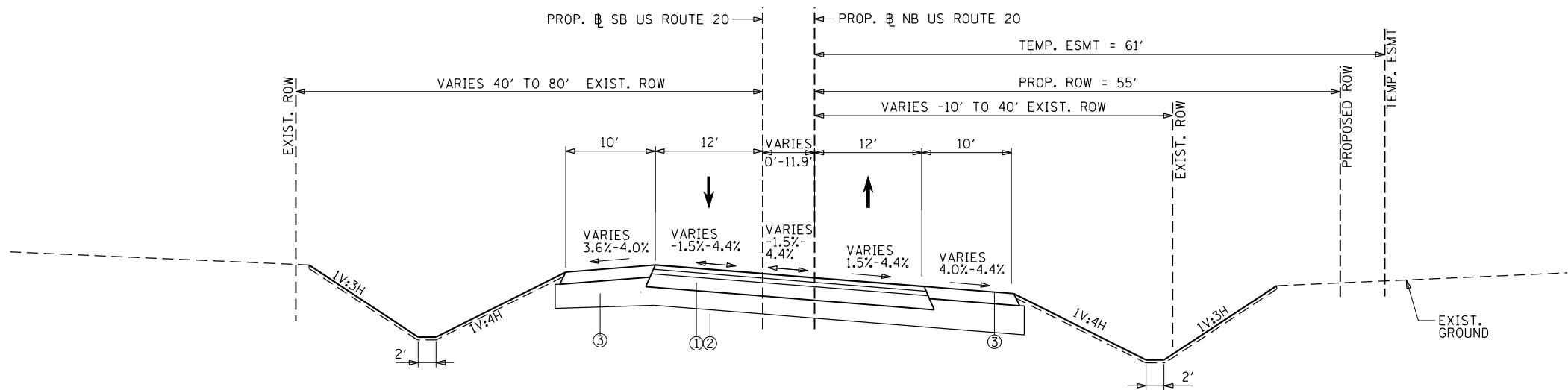
STA. 702+28.88'NB' TO 704+73.29'NB'

- ① 12 1/4" FULL DEPTH HMA PAVEMENT

② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ HMA SHOULDER

④ M-4.24 PCC CURB & GUTTER

⑤ MODIFIED M-4.24 PCC CURB & GUTTER (PITCHED OUTWARD)



PROPOSED US ROUTE 20

STA. 704+73.29'NB' TO 710+77.46'NB'

- ① 12 1/4" FULL DEPTH HMA PAVEMENT

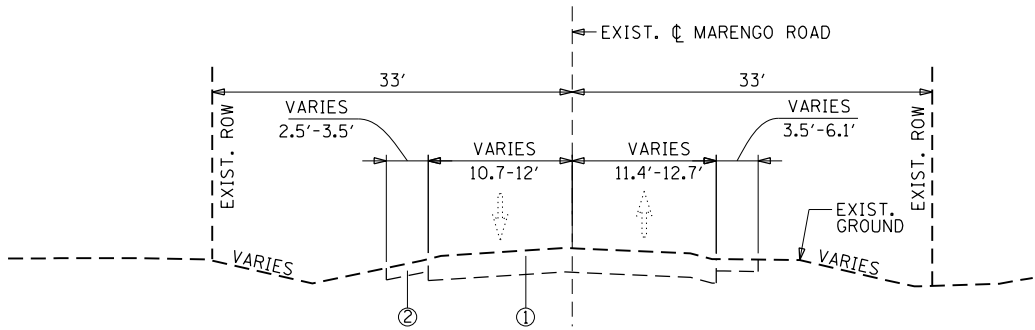
② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ HMA SHOULDER

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Exhibit E-2

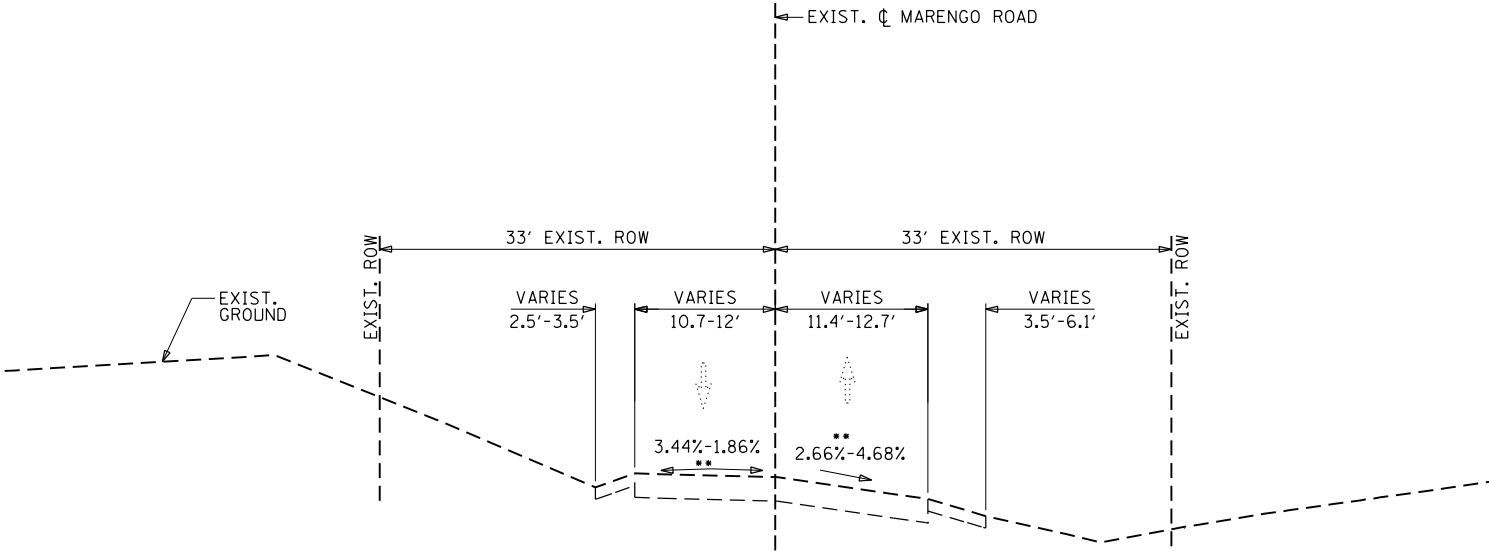
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Preliminary  
Subject to Change



EXISTING MARENGO ROAD  
STA. 300+00.00 TO 302+45.54\*

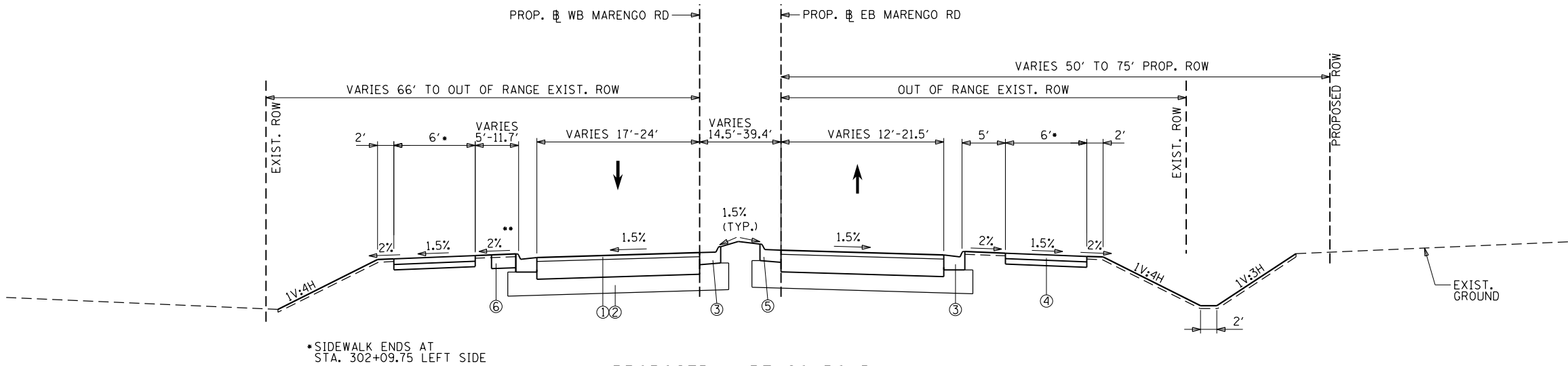
- EXISTING CROSS SECTION STATIONS ARE NOT THE SAME AS PROPOSED CROSS SECTION STATIONS
- ① HMA PAVEMENT
  - ② AGGREGATE SHOULDER



EXISTING MARENGO ROAD  
STA. 302+45.54 TO 309+39.30\*

- EXISTING CROSS SECTION STATIONS ARE NOT THE SAME AS PROPOSED CROSS SECTION STATIONS
- ① HMA PAVEMENT
  - ② AGGREGATE SHOULDER

•• EXISTING SUPERELEVATION VALUES UNKNOWN



PROPOSED MARENGO ROAD  
STA. 301+19.16'EB' TO 302+32.70'EB'

- ① 9¼" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ M-4.24 PCC CURB & GUTTER
- ④ SIDEWALK - 5" CONCRETE SIDEWALK W/AGG. BASE COURSE
- ⑤ MODIFIED M-4.24 PCC CURB & GUTTER (PITCHED OUTWARD)
- ⑥ 8" COLORED CONCRETE MEDIAN SURFACE

- SIDEWALK ENDS AT STA. 301+86.75 RIGHT SIDE
- COLORED CONCRETE MEDIAN SURFACE (2' TO 7' WIDTH) STA. 301+19.16'EB' TO STA. 301+50.00'EB' LEFT SIDE

Exhibit E-2

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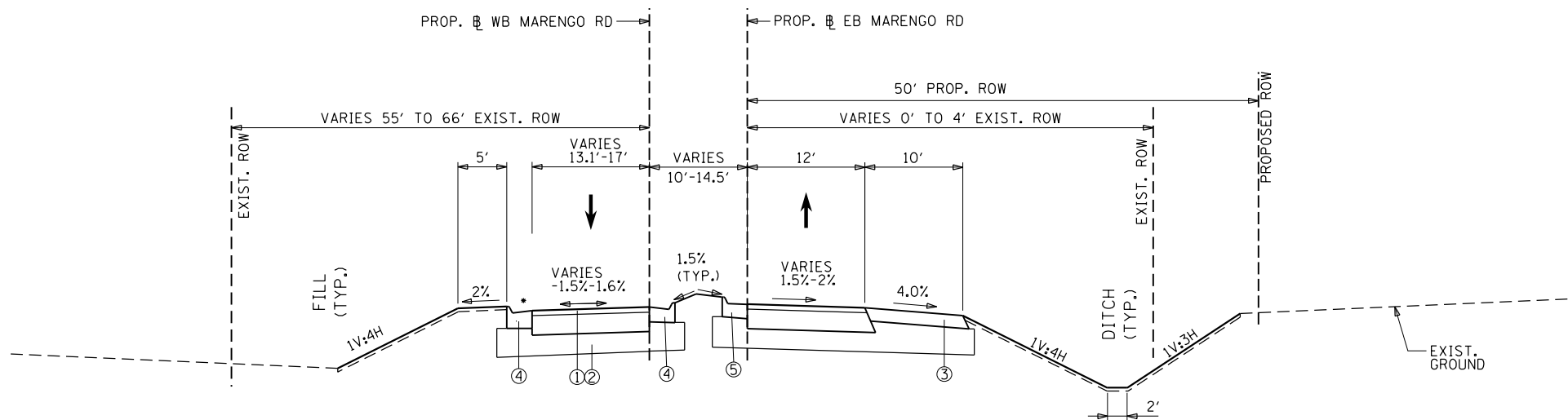
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PLOT DATE = 2/18/2016	DATE - 6/01/15	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

US ROUTE 20 AT MARENGO/BECK ROAD TYPICAL SECTIONS - MARENGO ROAD		
SCALE: N.T.S	SHEET NO. 4 OF 10 SHEETS	STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
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CONTRACT NO. 60T26				
ILLINOIS FED. AID PROJECT				

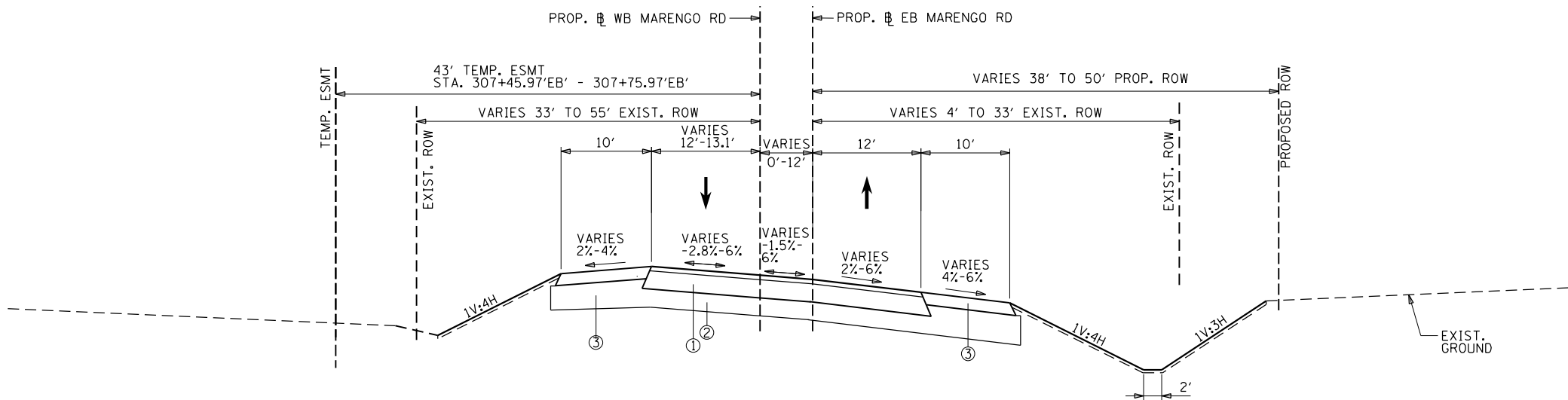
Preliminary  
Subject to Change



PROPOSED MARENGO ROAD

STA. 302+32.70'EB' TO 303+11.05'EB'

- \*M-4.24 CURB & GUTTER ENDS AT STA. 302+98.28'EB' LEFT SIDE
- ① 9 1/4" FULL DEPTH HMA PAVEMENT
  - ② 12" AGGREGATE SUBGRADE IMPROVEMENT
  - ③ HMA SHOULDER
  - ④ M-4.24 PCC CURB & GUTTER
  - ⑤ MODIFIED M-4.24 PCC CURB & GUTTER (PITCHED OUTWARD)



PROPOSED MARENGO ROAD

STA. 303+11.05'EB' TO 308+04.85'EB'

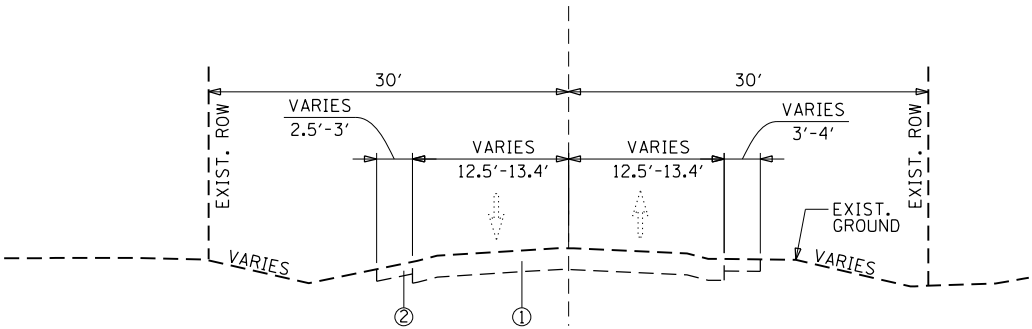
- ① 9 1/4" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ HMA SHOULDER

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Exhibit E-2

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				STA. TO STA.								

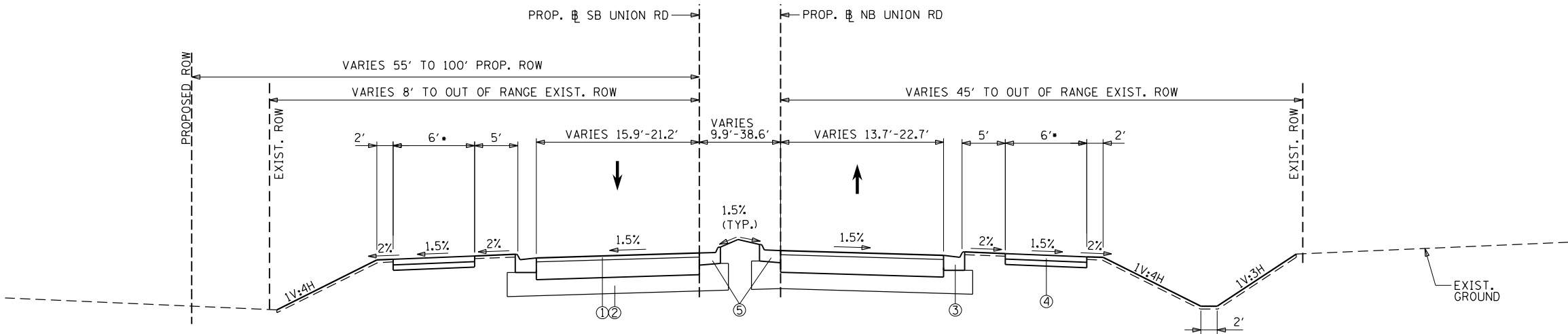
Preliminary  
Subject to Change



EXISTING SOUTH UNION ROAD

STA. 400+00.00 TO 410+51.79\*

- EXISTING CROSS SECTION STATIONS ARE NOT THE SAME AS PROPOSED CROSS SECTION STATIONS
- ① HMA PAVEMENT
- ② AGGREGATE SHOULDER



PROPOSED SOUTH UNION ROAD

STA. 501+17.66'NB' TO 502+10.66'NB'

\*SIDEWALK ENDS AT  
STA. 502+37.19'NB' LEFT SIDE

\*SIDEWALK ENDS AT  
STA. 501+91.06'NB' RIGHT SIDE

- ① 9 1/4" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ M-4.24 PCC CURB & GUTTER
- ④ SIDEWALK - 5" CONCRETE SIDEWALK W/AGG. BASE COURSE
- ⑤ MODIFIED M-4.24 PCC CURB & GUTTER (PITCHED OUTWARD)

Exhibit E-2

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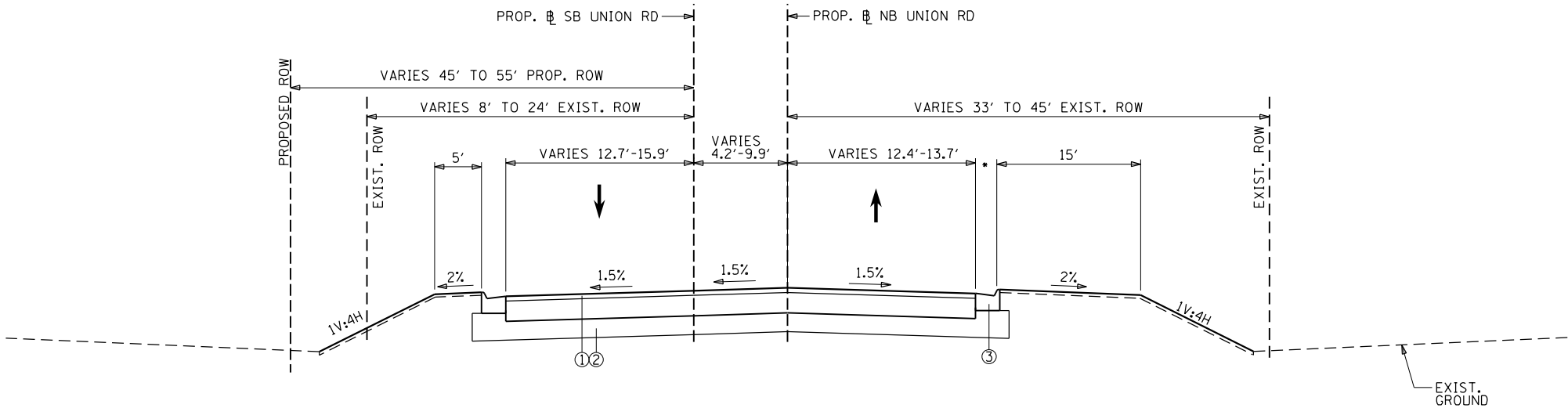
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

US ROUTE 20 AT MARENGO/BECK ROAD  
TYPICAL SECTIONS - SOUTH UNION ROAD

SCALE: N.T.S. SHEET NO. 6 OF 10 SHEETS STA. TO STA.

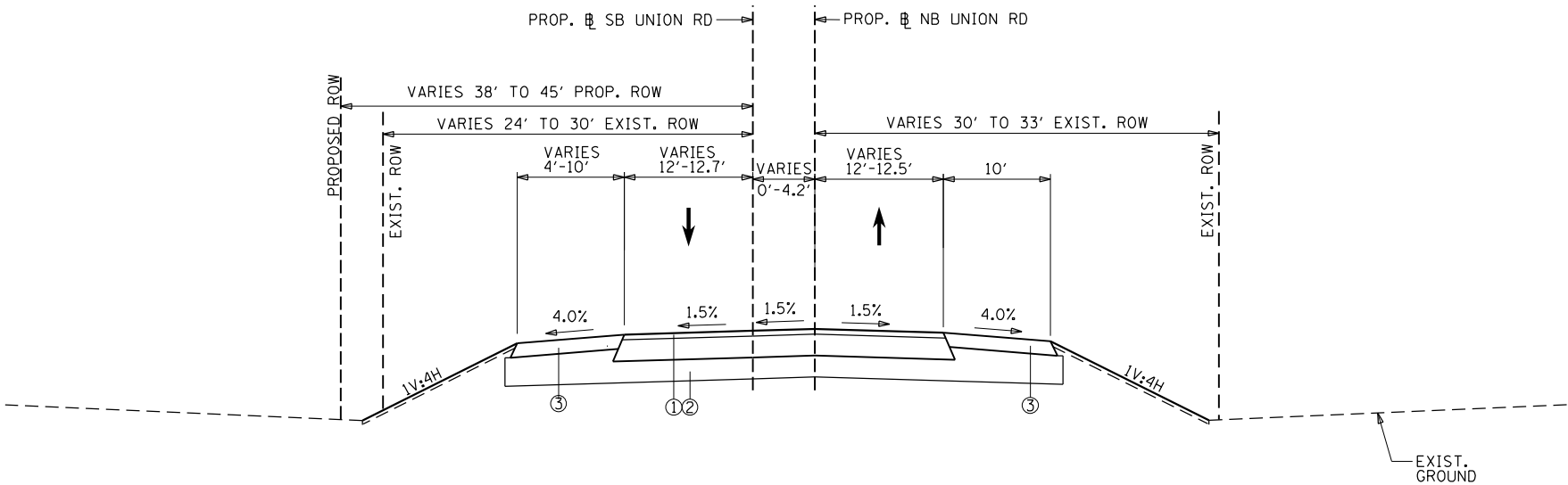
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
525		MCHENRY	10	6
CONTRACT NO. 60T26				
ILLINOIS FED. AID PROJECT				

Preliminary  
Subject to Change



- ① 9 1/4" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ M-4.24 PCC CURB & GUTTER

•M-4.24 CURB & GUTTER ENDS AT  
STA. 502+73.07'NB' RIGHT SIDE



- ① 9 1/4" FULL DEPTH HMA PAVEMENT
- ② 12" AGGREGATE SUBGRADE IMPROVEMENT
- ③ HMA SHOULDER

Exhibit E-2

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PLOT DATE = 2/18/2016	DATE - 6/01/15	REVISED -

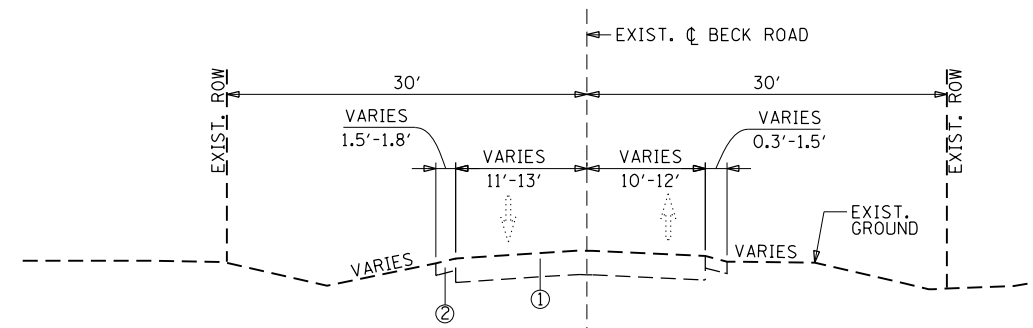
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

US ROUTE 20 AT MARENGO/BECK ROAD  
TYPICAL SECTIONS - SOUTH UNION ROAD

SCALE: N.T.S. SHEET NO. 7 OF 10 SHEETS STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
525		MCHENRY	10	7
CONTRACT NO. 60T26				
ILLINOIS FED. AID PROJECT				

**Preliminary  
Subject to Change**

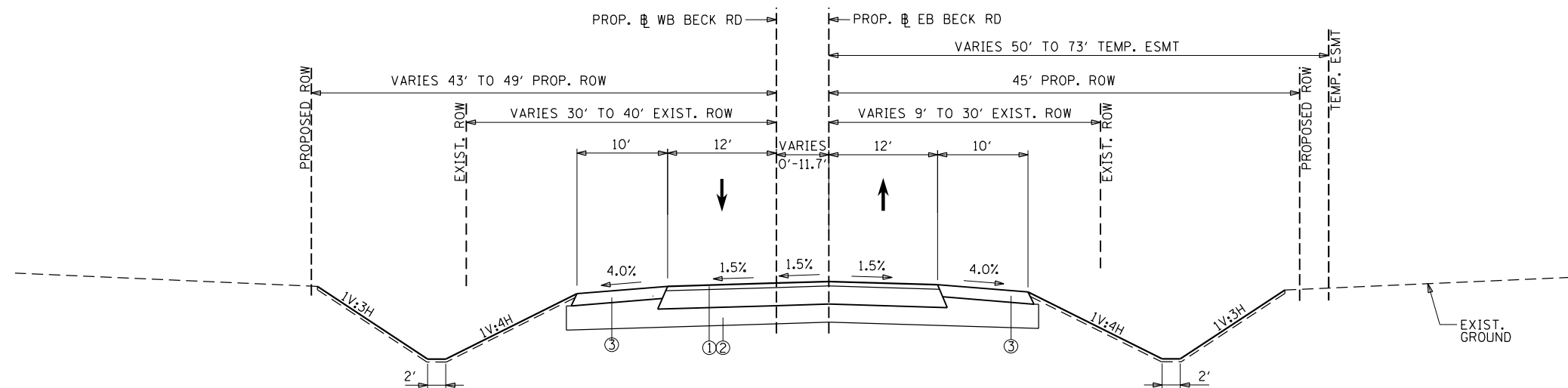


EXISTING BECK ROAD

EXISTING STA. 195+00.00 TO EXISTING STA 200+00.00 \*

•EXISTING CROSS SECTION STATIONS ARE NOT THE SAME AS PROPOSED CROSS SECTION STATIONS

- ① HMA PAVEMENT
- ② AGGREGATE SHOULDER



PROPOSED BECK ROAD

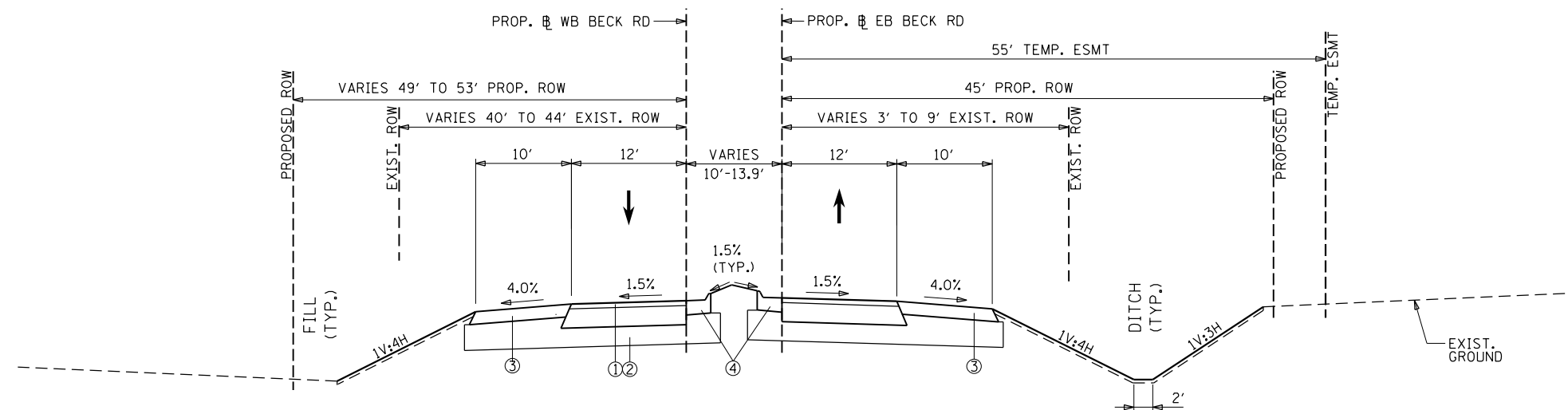
STA. 1000+45.39'EB' TO 1004+25.30'EB'

- ① 7" FULL DEPTH HMA PAVEMENT                      ③ HMA SHOULDER  
② 12" AGGREGATE SUBGRADE IMPROVEMENT

USER NAME = ncook	DESIGNED - JTD	REVISED - 11/3/15	<div style="text-align: center;"> <b>STATE OF ILLINOIS</b>  <b>DEPARTMENT OF TRANSPORTATION</b> </div>	<div style="text-align: center;"> <b>US ROUTE 20 AT MARENGO/BECK ROAD</b>  <b>TYPICAL SECTIONS - BECK ROAD</b> </div>			F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	DRAWN - JTD	REVISED - 2/2/16					525		MCHENRY	10	8
PLOT SCALE = 16.0000' / 1in.	CHECKED - JJM	REVISED -		SCALE: N.T.S.	SHEET NO. 8 OF 10 SHEETS	STA.	TO STA.		ILLINOIS FED. AID PROJECT		
PLOT DATE = 2/18/2016	DATE = 6/01/15	REVISED -					CONTRACT NO. 60T26				

FILE NAME = G:\86\8616602 US 20 at Marengo IL\DOT\CADD\Sheet\160T26-Sht-Typical.dgn

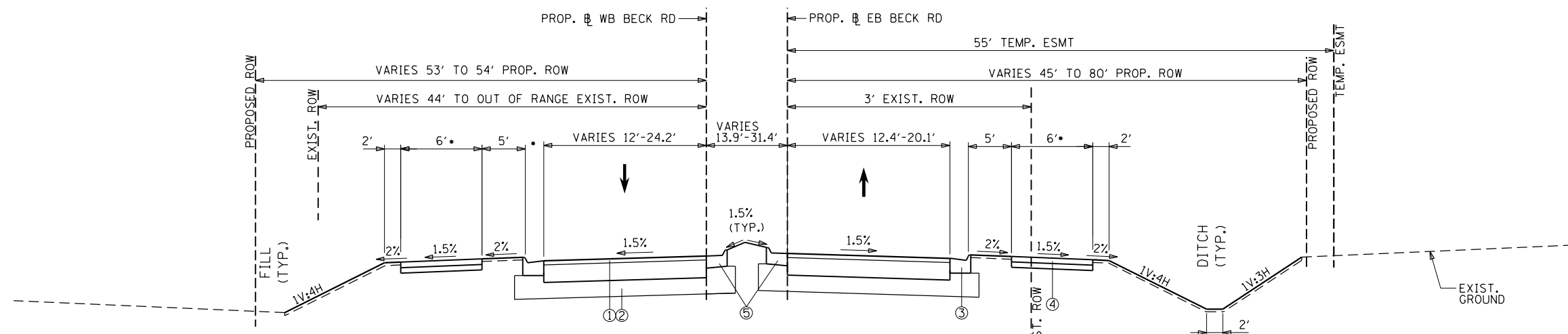
**Preliminary  
Subject to Change**



PROPOSED BECK ROAD

STA. 1004+25.30'EB' TO 1005+37.21'EB'

- |  |                                      |   |
|--|--------------------------------------|---|
| *M4.24 CURB & GUTTER BEGINS AT STA. 1005+68.46'EB' LEFT SIDE | ① 7" FULL DEPTH HMA PAVEMENT         | ③ HMA SHOULDER  |
| SIDEWALK BEGINS AT STA. 1006+06.05'EB' LEFT SIDE             | ② 12" AGGREGATE SUBGRADE IMPROVEMENT | ④ MODIFIED M-4.24 PCC CURB & GUTTER (PITCHED OUTWARD) |



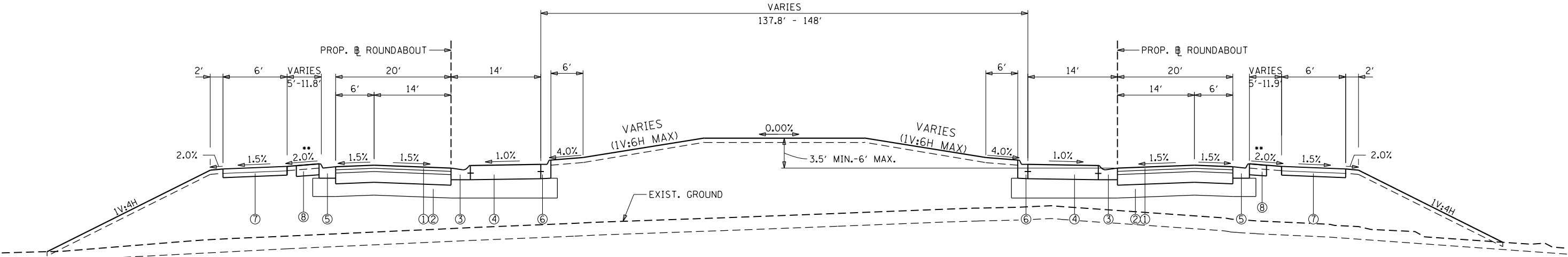
PROPOSED BECK ROAD

STA. 1005+37.21'EB' TO 1006+76.46'EB'

- |   |  |
|---|--|
| ① 7" FULL DEPTH HMA PAVEMENT            | ④ SIDEWALK - 5" CONCRETE SIDEWALK<br>W/AGG. BASE COURSE  |
| ② 12" AGGREGATE SUBGRADE<br>IMPROVEMENT | ⑤ MODIFIED M-4.24 PCC CURB & GUTTER<br>(PITCHED OUTWARD) |
| ③ M-4.24 PCC CURB & GUTTER              |  |

USER NAME = ncook	DESIGNED - JTD	REVISED - 11/3/15	<div style="text-align: center;"> <b>STATE OF ILLINOIS</b>  <b>DEPARTMENT OF TRANSPORTATION</b> </div>	<div style="text-align: center;"> <b>US ROUTE 20 AT MARENGO/BECK ROAD</b>  <b>TYPICAL SECTIONS - BECK ROAD</b> </div>			F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
	DRAWN - JTD	REVISED - 2/2/16					525		MCHENRY	10	9
PLOT SCALE = 16.0000' / 1in.	CHECKED - JJM	REVISED -		SCALE: N.T.S.	SHEET NO. 9 OF 10 SHEETS	STA.	TO STA.				
PLOT DATE = 2/18/2016	DATE - 6/01/15	REVISED -					ILLINOIS FED. AID PROJECT CONTRACT NO. 60T26				

Preliminary  
Subject to Change



PROPOSED US20/MARENGO ROAD/BECK ROAD/SOUTH UNION ROAD

- ① 12 1/4" FULL DEPTH HMA PAVEMENT

② 12" AGGREGATE SUBGRADE IMPROVEMENT

③ CURB & GUTTER, SPECIAL (SEE DETAIL THIS SHEET)

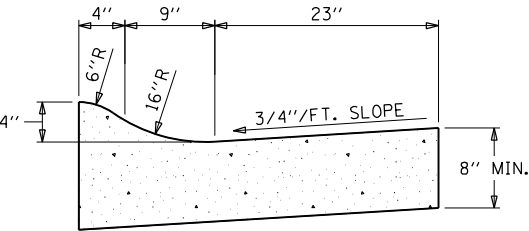
④ 12" PCC TRUCK APRON
- ⑤ M-4.24 PCC CURB & GUTTER

⑥ MODIFIED B-9.12 PCC CURB & GUTTER (PITCHED OUTWARD)

⑦ SIDEWALK - 5" CONCRETE SIDEWALK W/AGG. BASE COURSE

⑧ 8" COLORED CONCRETE MEDIAN SURFACE

•• COLORED CONCRETE MEDIAN SURFACE (2' TO 7.5' WIDTH)  
STA. 10+75.98'C' TO STA. 11+09.59'C' RIGHT SIDE  
COLORED CONCRETE MEDIAN SURFACE (2' TO 7' WIDTH)  
STA. 12+69.26'C' TO STA. 13+03.36'C' RIGHT SIDE



③ CURB & GUTTER, SPECIAL

Exhibit E-2

FILE NAME = G:\861\8616602 US 20 at Marengo IL\DOT\CADD\CADD Sheets\1060126-Sht-Typical.dgn

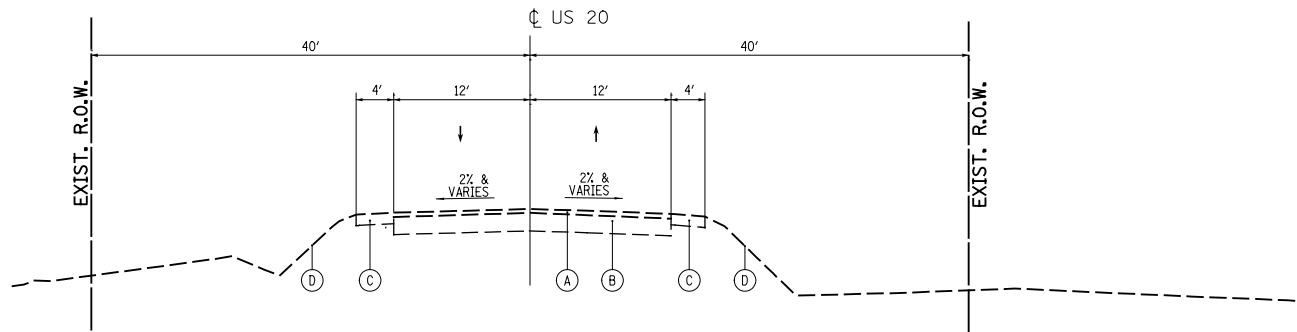
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	DRAWN - JTD	REVISED - 2/2/16
PLOT SCALE = 16.0000' / 1 in.	CHECKED - JJM	REVISED -
PLOT DATE = 2/18/2016	DATE - 6/01/15	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

US ROUTE 20 AT MARENGO/BECK ROAD TYPICAL SECTIONS - ROUNDABOUT		
SCALE: N.T.S	SHEET NO. 10 OF 10 SHEETS	STA. TO STA.

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
525		MCHENRY	10	10
CONTRACT NO. 60T26				
ILLINOIS FED. AID PROJECT				

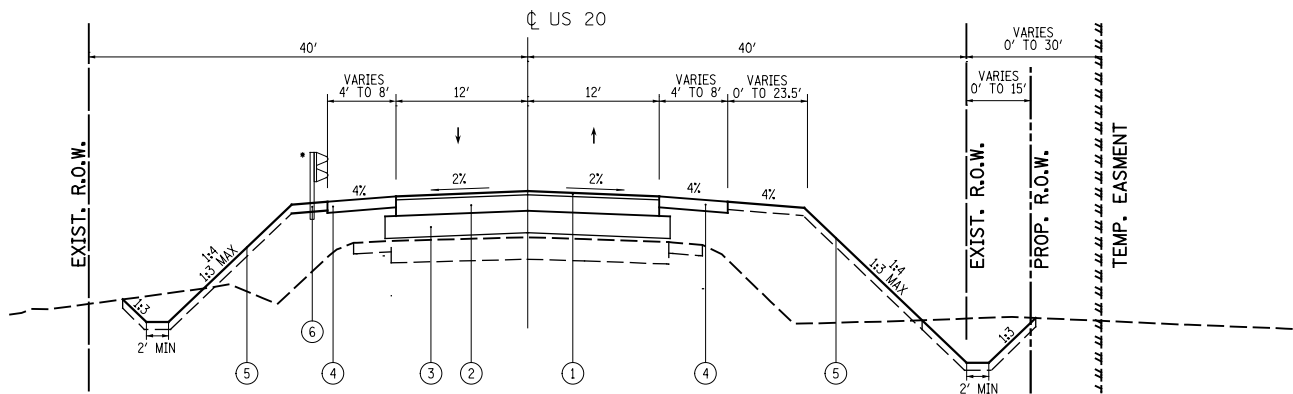




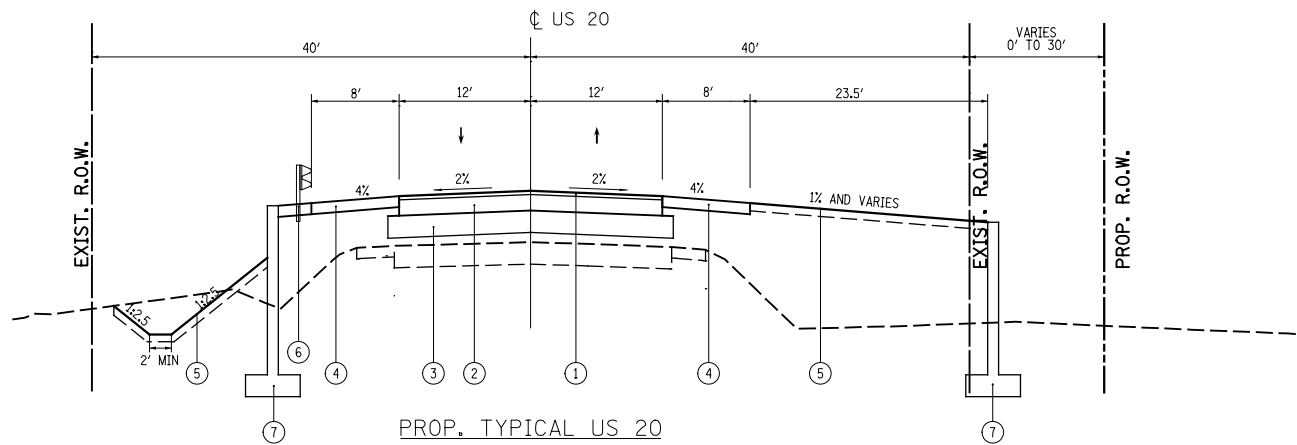
EXIST. TYPICAL US 20  
STA. 509+15.22 TO STA. 15+00.00

- EXISTING LEGEND**
- (A) EXISTING BITUMINOUS OVERLAY
  - (B) EXISTING PCC BASE
  - (C) EXISTING HMA SHOULDER
  - (D) EXISTING GROUND LINE

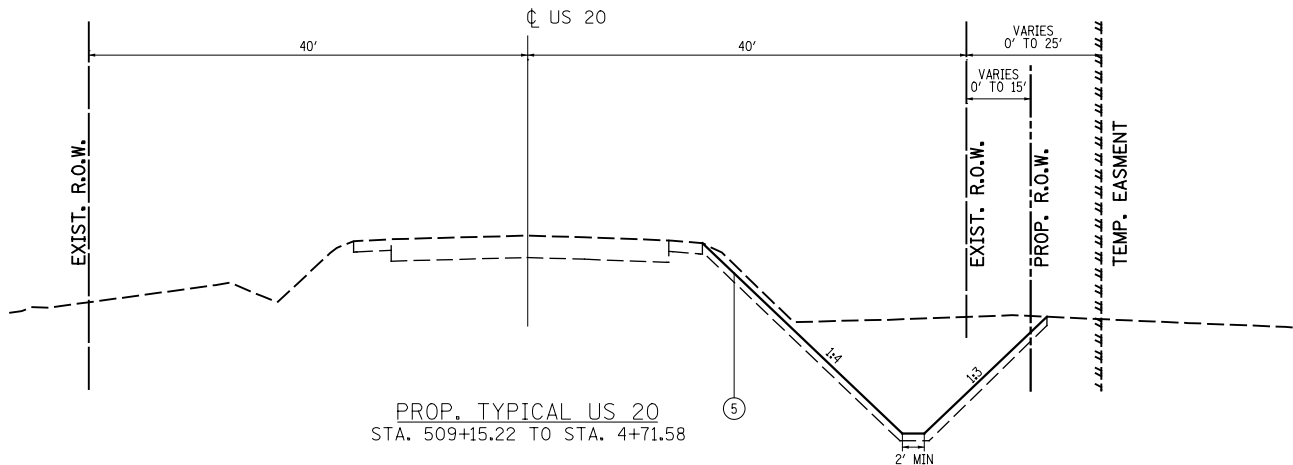
- PROPOSED LEGEND**
- (1) PROP. HMA SURFACE COURSE, MIX "D", N70, 2"
  - (2) PROP. HMA BASE COURSE, 1L-19.0, N70, 8 3/4"
  - (3) PROP. AGGREGATE SUBGRADE IMPROVEMENT, 12"
  - (4) PROP. HMA SHOULDER
  - (5) PROP. GROUND LINE
  - (6) PROP. GUARDRAIL
  - (7) PROP. RETAINING WALL
  - (8) PROP. STORM SEWER



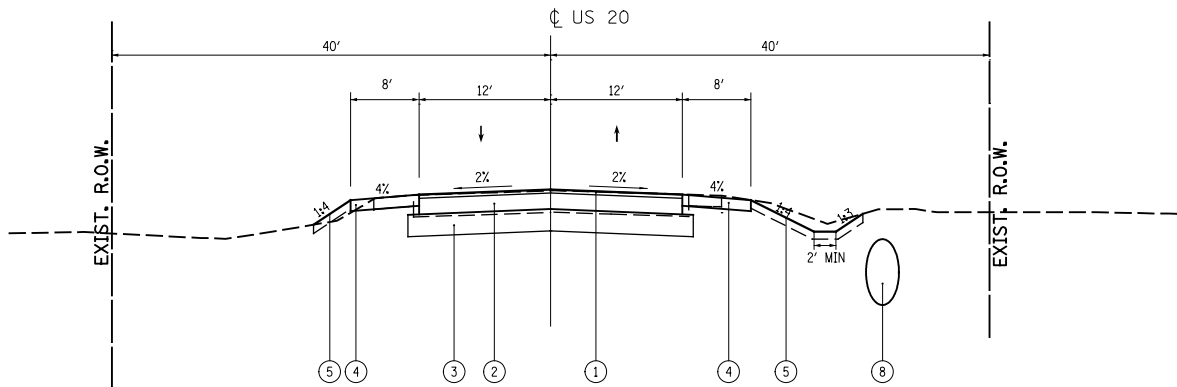
PROP. TYPICAL US 20  
STA. 6+21.98 TO STA. 9+00.00  
STA. 11+00.00 TO STA. 15+00.00  
\*STA. 8+52.50 TO STA. 9+00.00  
\*STA. 11+00.00 TO STA. 11+90.00



PROP. TYPICAL US 20  
STA. 9+00.00 TO STA. 11+00.00



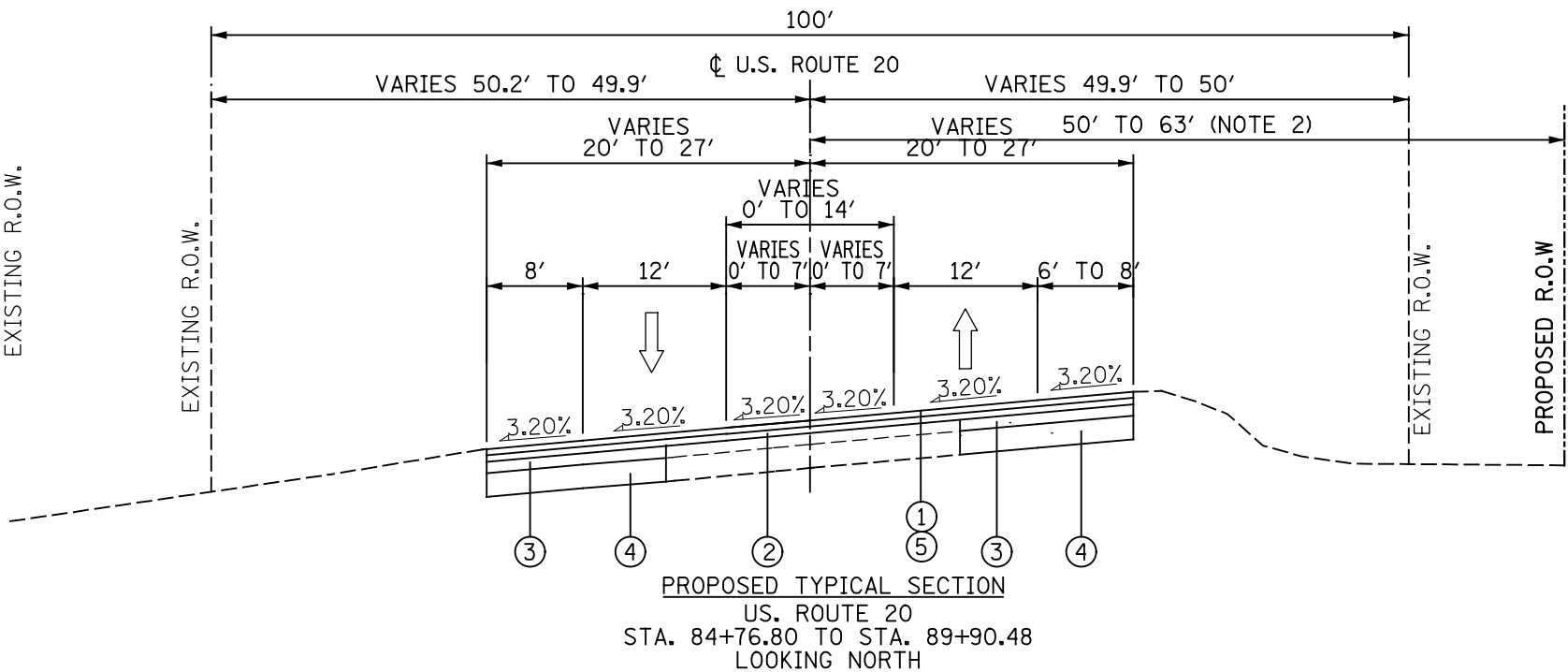
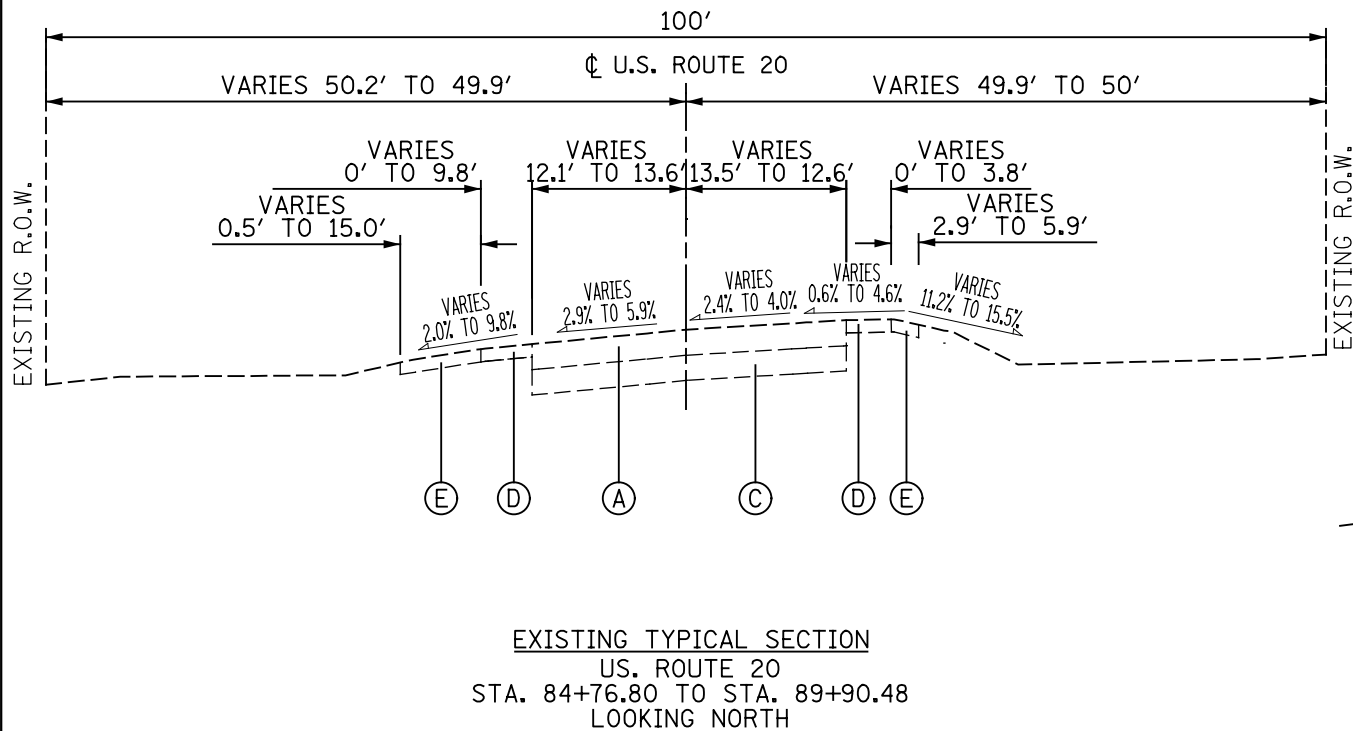
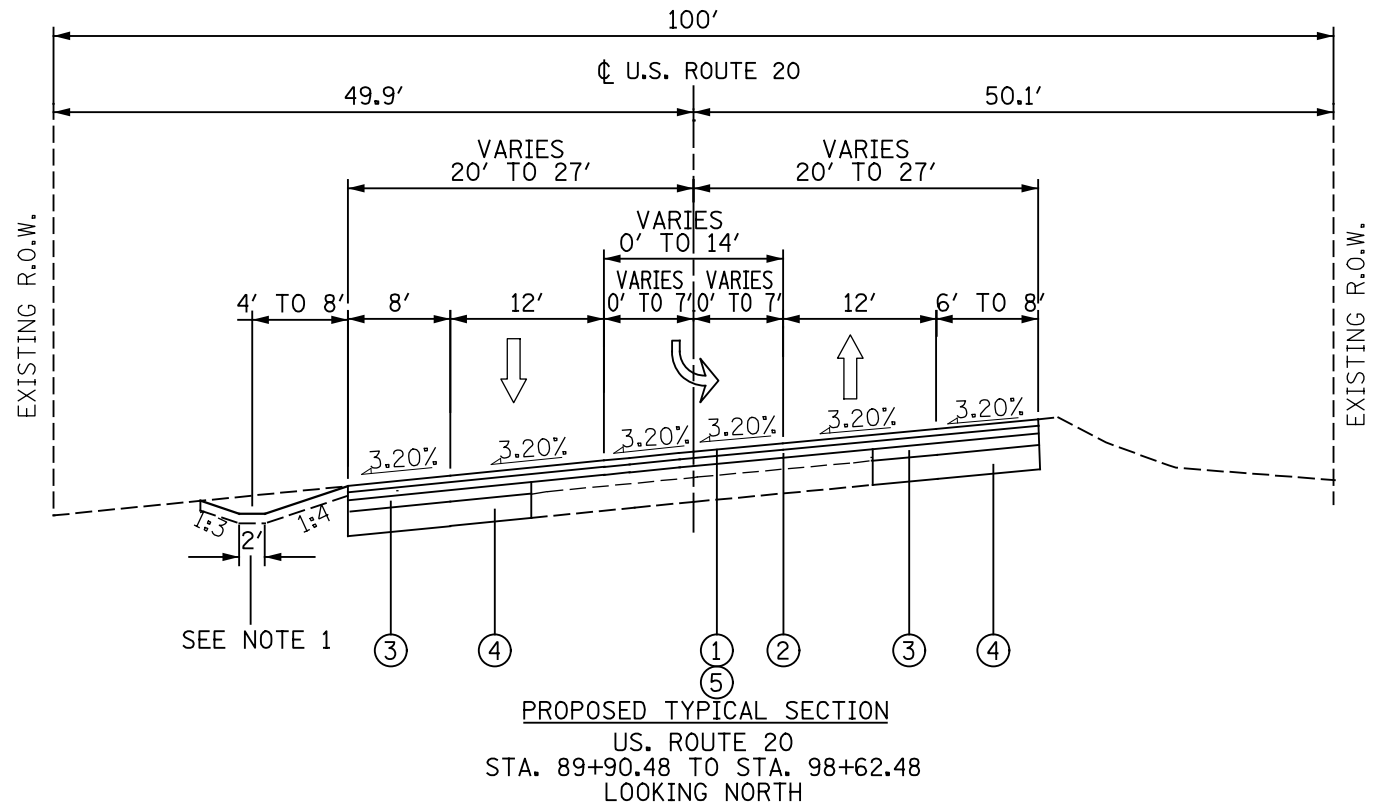
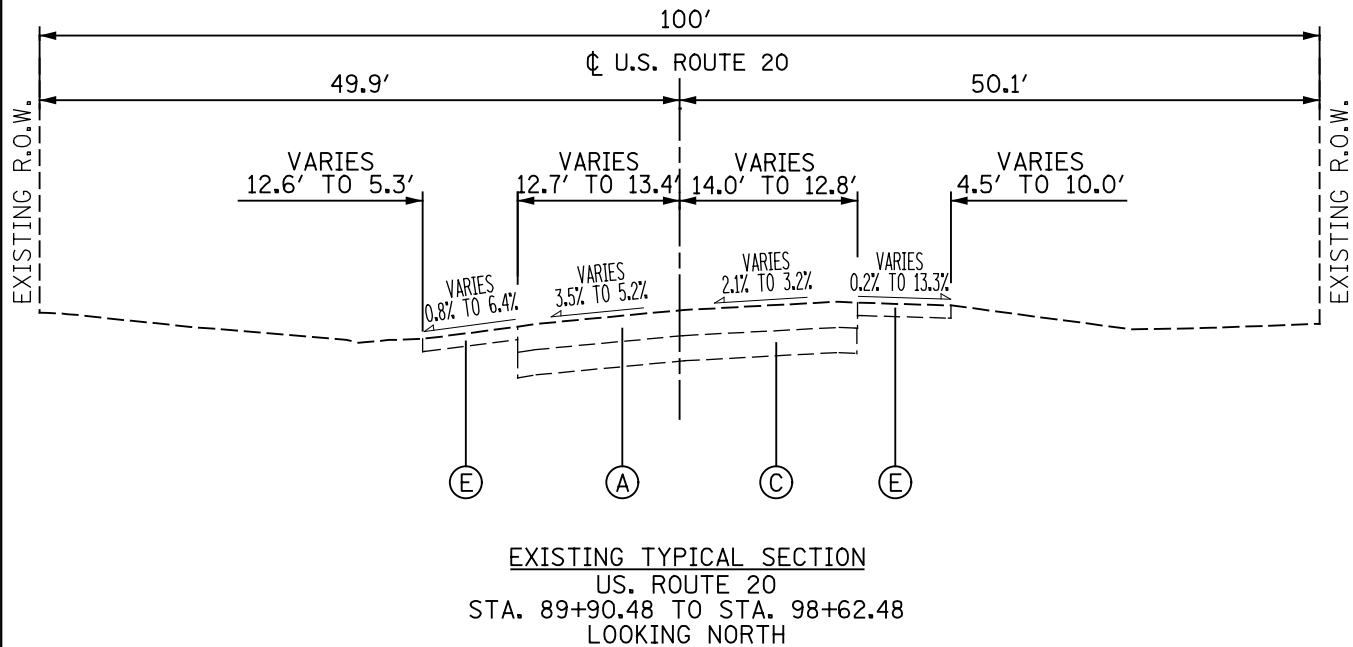
PROP. TYPICAL US 20  
STA. 509+15.22 TO STA. 4+71.58



PROP. TYPICAL US 20  
STA. 4+71.58 TO STA. 6+21.98

PLAN	SURVEYED _____		BY _____	DATE _____
	PLOTTED _____			
	ALIGNMENT CHECKED _____			
	RT. OF WAY CHECKED _____			
	CADD FILE NAME _____			
NOTE BOOK				
No. _____				

PROFILE	SURVEYED _____		BY _____	DATE _____
	PLOTTED _____			
	GRADES CHECKED _____			
	B.M. NOTED _____			
	STRUCTURE NOTAT'NS CHK'D _____			
NOTE BOOK				
NO. _____				



NOTE 1: DITCH SECTION STA. 94+00.00 TO STA.96+77.70  
NOTE 2: PROPOSED ROW SECTION STA. 88+87.73 TO STA. 89+03.5

EXISTING CONDITIONS

- (A) EXISTING HOT-MIX ASPHALT PAVEMENT, 8"±
- (B) EXISTING HOT-MIX ASPHALT PAVEMENT
- (C) EXISTING PCC BASE COURSE, 8"±
- (D) EXISTING HOT-MIX ASPHALT SHOULDER
- (E) EXISTING AGGREGATE SHOULDER

PROPOSED IMPROVEMENTS

- (1) PROPOSED POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "F", N90, 1 3/4"
- (2) PROPOSED POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75 (MM), N50, 3/4"
- (3) PROPOSED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N90, 8 3/4"
- (4) PROPOSED AGGREGATE SUBGRADE IMPROVEMENT, 12"
- (5) PROPOSED HOT-MIX ASPHALT SURFACE REMOVAL, 2 1/2"

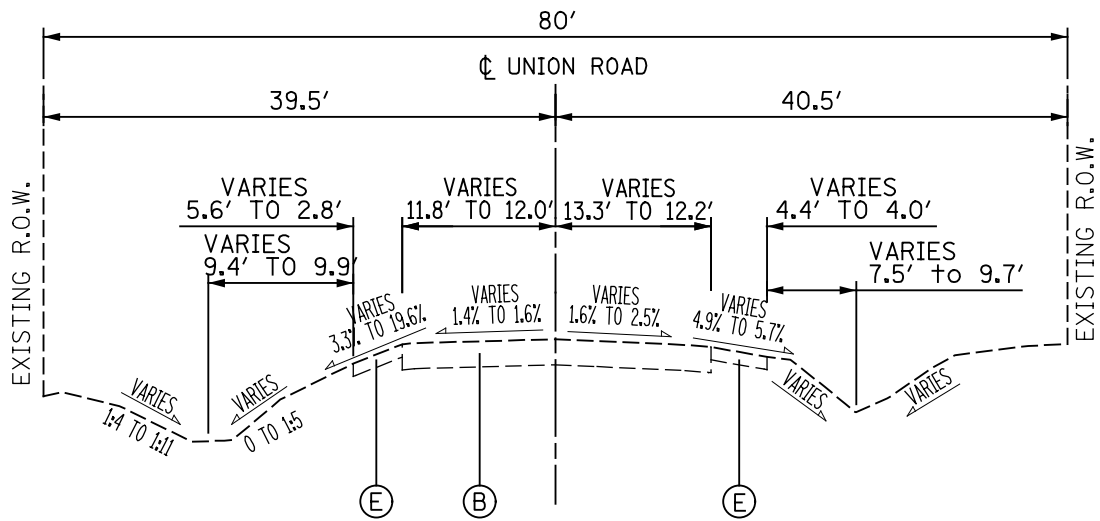
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		CHECKED - LSY	REVISED - 04/30/2015
		DATE - 03/05/2015	REVISED - 08/08/2016

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

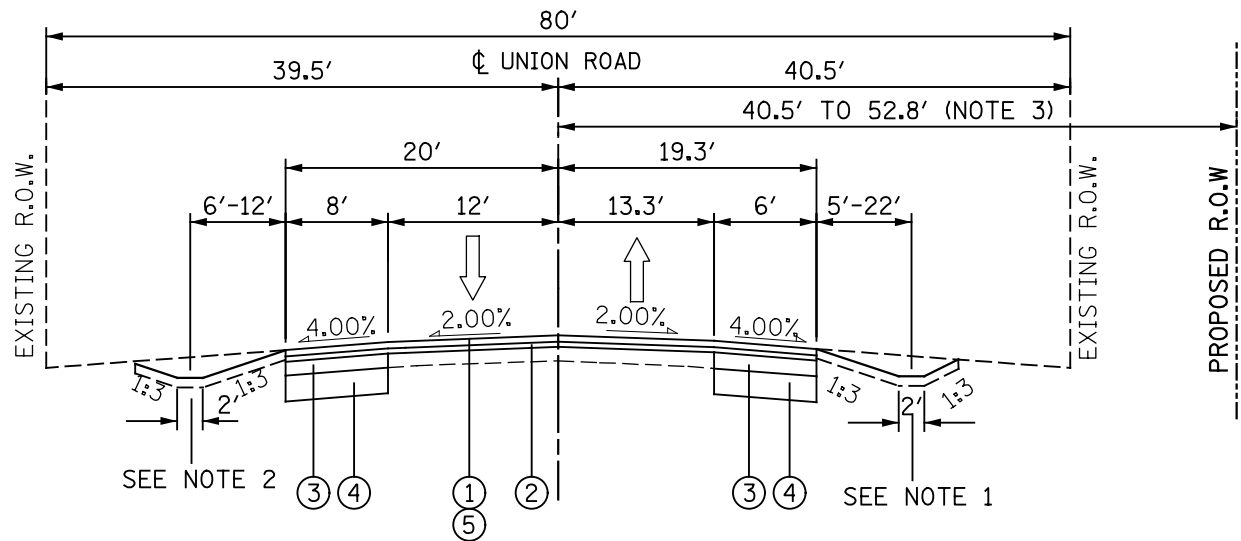
TYPICAL SECTION PLAN U.S. ROUTE 20 AND WEST UNION ROAD		F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
SCALE:		525		MCHENRY	4	1
SHEET 1 OF 4 SHEETS		CONTRACT NO. 13587				
STA. 84+76.80 TO STA. 98+62.48		ILLINOIS FED. AID PROJECT				

PLAN	SURVEYED PLOTTED NOTE BOOK NO.	CHECKED AT CADD FILE NAME	BY	DATE

PROFILE	SURVEYED PLOTTED NOTE BOOK NO.	GRADES CHECKED STRUCTURE NOTATIONS CHKD	BY	DATE



EXISTING TYPICAL SECTION  
UNION ROAD  
STA. 100+00.00 TO STA. 101+56.56  
LOOKING EAST



PROPOSED TYPICAL SECTION  
UNION ROAD  
STA. 100+00.00 TO STA. 101+56.56  
LOOKING EAST

- NOTE 1. PROPOSED DITCH SECTION STA. 100+83.9 TO 101+51.5  
NOTE 2. PROPOSED DITCH SECTION STA. 100+63.5 TO 101+11.26  
NOTE 3. PROPOSED ROW SECTION STA. 100+99.5 TO STA. 101+05.9

EXISTING CONDITIONS

- (A) EXISTING HOT-MIX ASPHALT PAVEMENT, 8"±  
(B) EXISTING HOT-MIX ASPHALT PAVEMENT  
(C) EXISTING PCC BASE COURSE, 8"±  
(D) EXISTING HOT-MIX ASPHALT SHOULDER  
(E) EXISTING AGGREGATE SHOULDER

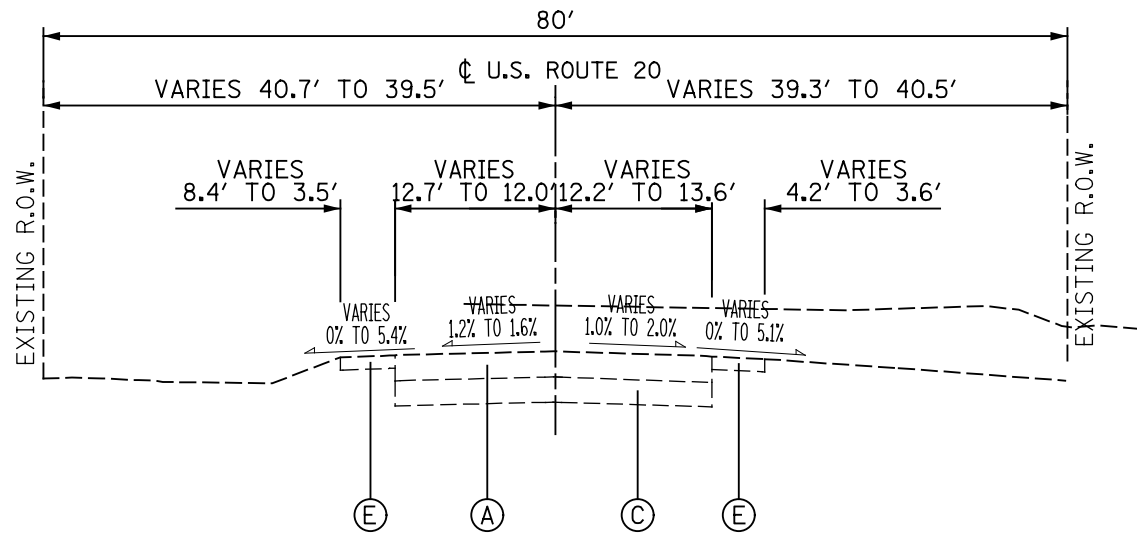
PROPOSED IMPROVEMENTS

- (1) PROPOSED POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "F", N90, 1 3/4"  
(2) PROPOSED POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75 (MM), N50, 3/4"  
(3) PROPOSED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N90, 8 3/4"  
(4) PROPOSED AGGREGATE SUBGRADE IMPROVEMENT, 12"  
(5) PROPOSED HOT-MIX ASPHALT SURFACE REMOVAL, 2 1/2"

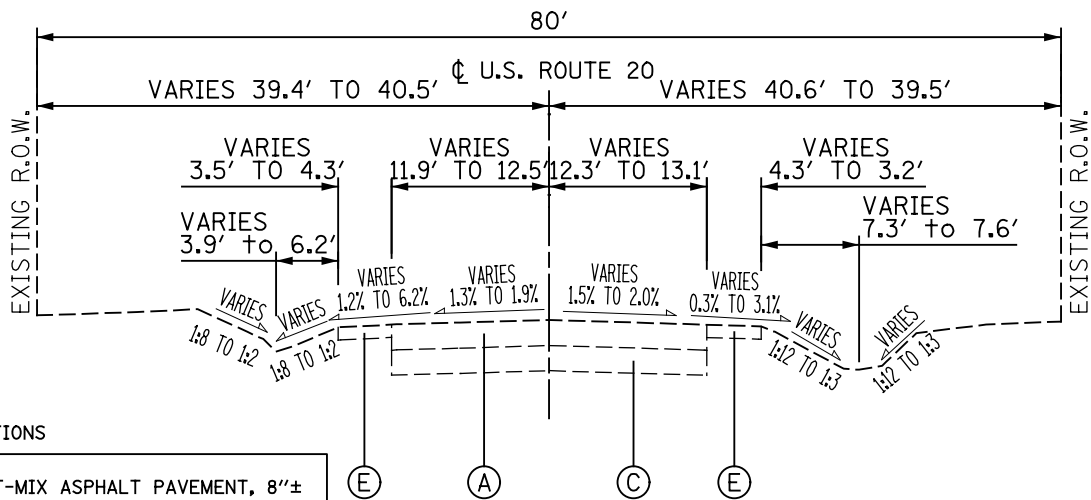
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		DRAWN - KH	REVISED - 03/05/2015						525		MCHENRY	4	2
PLOT SCALE = 1.0000' / 1" =	PLOT DATE = 8/8/2016	CHECKED - LSY	REVISED - 04/30/2015						CONTRACT NO. 13587				
		DATE - 03/05/2015	REVISED - 08/08/2016						ILLINOIS FED. AID PROJECT				

PLAN	SURVEYED	BY	DATE
	PLOTTED		
	CHECKED		
	ATTEMPT		
	CADD FILE NAME		
NOTE BOOK NO.			

PROFILE	SURVEYED	BY	DATE
	GRADES CHECKED		
	STRUCTURE		
	NOTATIONS CHKD		
NOTE BOOK NO.			



EXISTING TYPICAL SECTION  
US. ROUTE 20  
STA. 27+04.76 TO STA. 34+66.41  
LOOKING NORTH



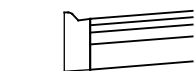
EXISTING TYPICAL SECTION  
US. ROUTE 20  
STA. 19+47.45 TO STA. 27+04.76  
LOOKING NORTH

#### EXISTING CONDITIONS

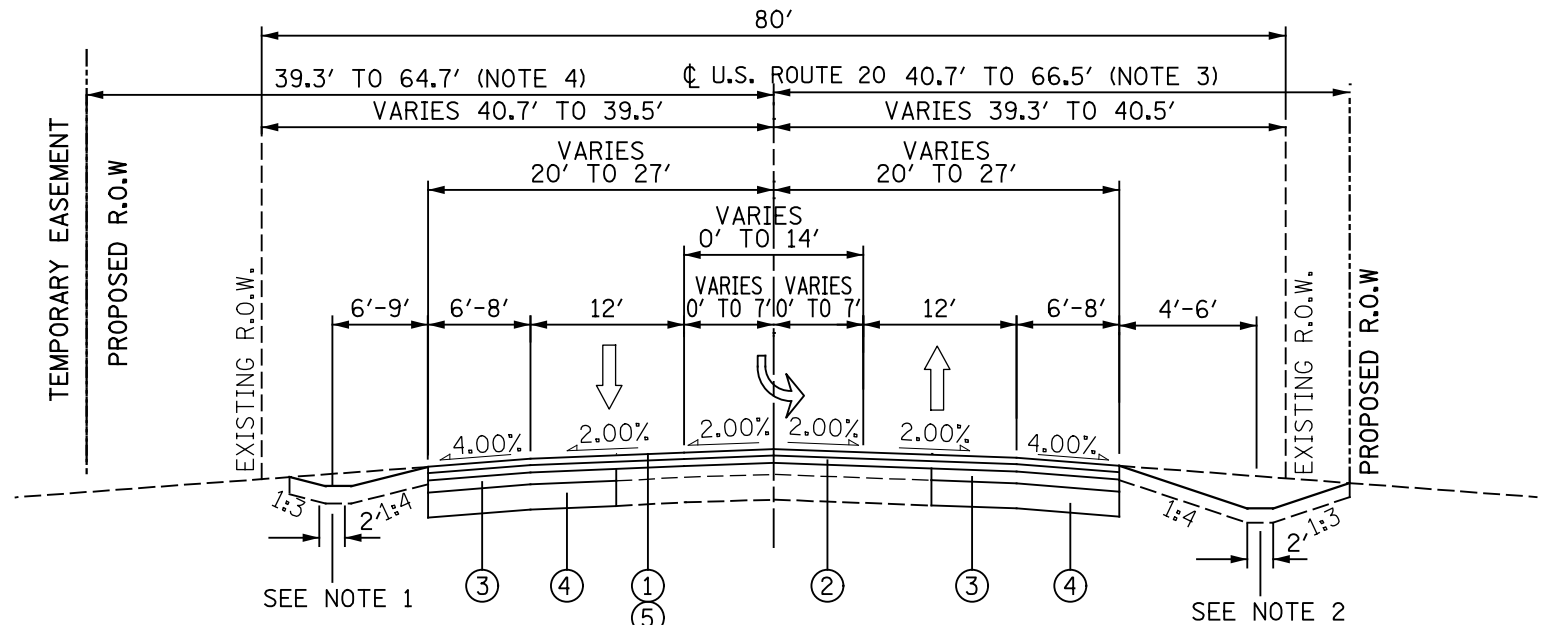
- (A) EXISTING HOT-MIX ASPHALT PAVEMENT, 8"±
- (B) EXISTING HOT-MIX ASPHALT PAVEMENT
- (C) EXISTING PCC BASE COURSE, 8"±
- (D) EXISTING HOT-MIX ASPHALT SHOULDER
- (E) EXISTING AGGREGATE SHOULDER

#### PROPOSED IMPROVEMENTS

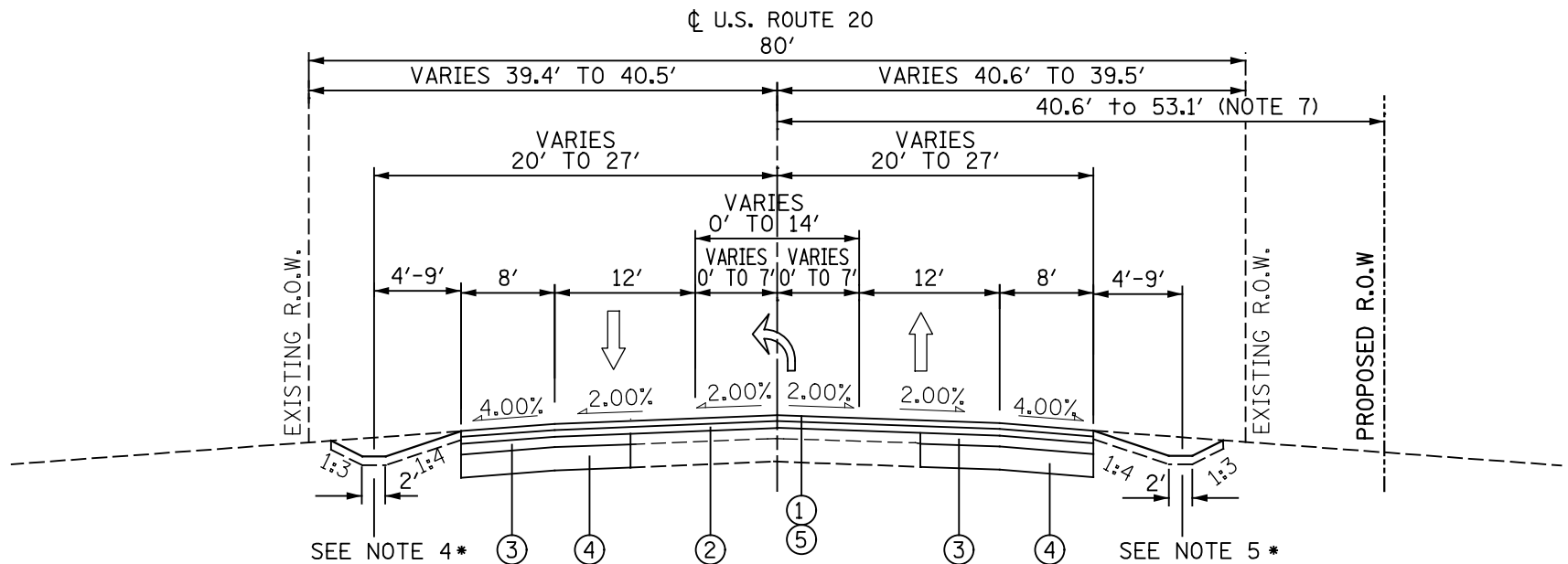
- (1) PROPOSED POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "F", N90, 1 3/4"
- (2) PROPOSED POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75 (MM), N50, 3/4"
- (3) PROPOSED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N90, 8 3/4"
- (4) PROPOSED AGGREGATE SUBGRADE IMPROVEMENT, 12"
- (5) PROPOSED HOT-MIX ASPHALT SURFACE REMOVAL, 2 1/2"



\* M-4.06 CURB AND GUTTER DETAIL



PROPOSED TYPICAL SECTION  
US. ROUTE 20  
STA. 27+04.76 TO STA. 34+66.41  
LOOKING NORTH



PROPOSED TYPICAL SECTION  
US. ROUTE 20  
STA. 19+47.45 TO STA. 27+04.76  
LOOKING NORTH

- NOTE 1. M4-06 DEPRESSED C&G 28+70 TO 29+07 & STA. 31+75 TO 31+87, SWALE STA. 32+00.00 TO STA. 34+50.00
- NOTE 2. M4-06 DEPRESSED C&G STA 29+58.8 TO 29+77.7, DITCH STA. 30+00.00 TO STA. 31+50.00
- NOTE 3. PROPOSED ROW STA 27+45.5 TO 27+65.2, TEMPORARY EASEMENT SECTION STA. 27+45.5 TO STA. 27+50.0
- NOTE 4. DITCH STA. 20+61.70 TO STA. 23+00.00, M4-06 CURB AND GUTTER STA. 25+40.8 TO STA. 26+92.54
- NOTE 5. DITCH STA. 20+61.70 TO 23+36.94 AND STA 23+84.10 TO STA. 25+00.00, M4-06 CURB AND GUTTER STA. 25+11.1 TO STA. 27+01.61
- NOTE 6. PROPOSED ROW STA. 26+61.0 TO STA. 26+74.83
- NOTE 7. PROPOSED ROW STA. 28+00.00 TO STA. 28+19.80

FILE NAME =	USER NAME = treesman(Rdwy_Lisle)	DESIGNED - KH	REVISED - 12/19/2014 03/05/2015
pwt\LSLPW.patrick.int21350.008-US20\Documents\CADD SHEETS\0113597-sht-tp.dgn		DRAWN - KH	REVISED - 05/07/2015 08/10/2015
PLOT SCALE = 1.0000' / 1in.		CHECKED - LSY	REVISED - 08/08/2016
PLOT DATE = 8/8/2016		DATE - 06/02/2016	REVISED -

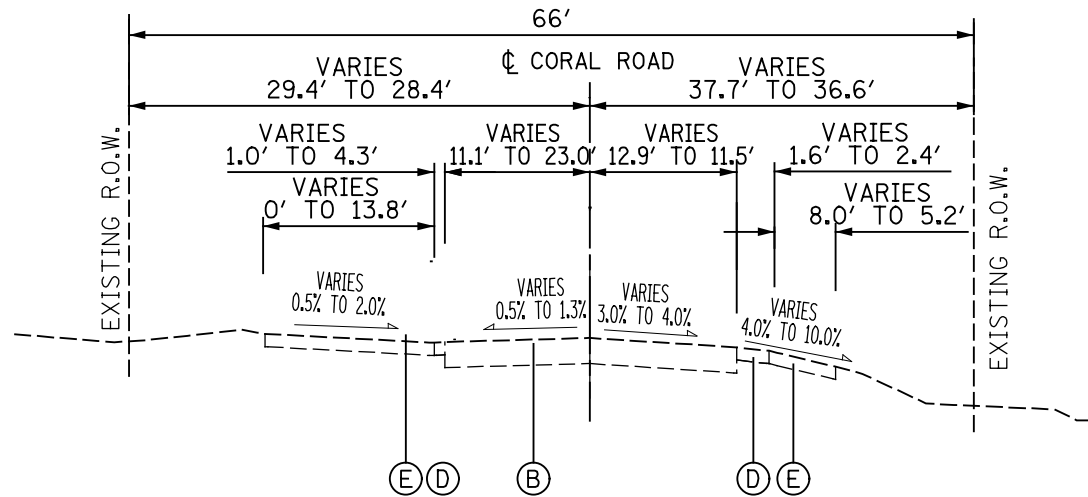
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PLAN U.S. ROUTE 20 AND CORAL ROAD			
SCALE:	SHEET 3 OF 4 SHEETS	STA. 19+47.45 TO STA. 34+66.41	

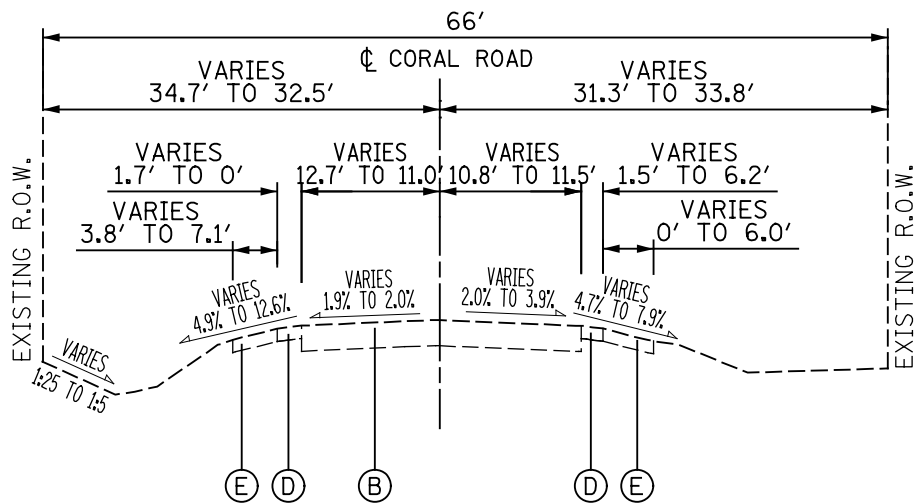
F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
525		MCHENRY	4	3
CONTRACT NO. 13587				
ILLINOIS FED. AID PROJECT				

PLAN	SURVEYED	DATE
	PLOTTED	BY
	CHECKED	
	AT	
	NO.	
	FILE NAME	

PROFILE	SURVEYED	DATE
	PLOTTED	BY
	CHECKED	
	AT	
	NO.	
	FILE NAME	



EXISTING TYPICAL SECTION  
CORAL ROAD  
STA. 200+00.00 TO STA. 203+05.19  
LOOKING EAST



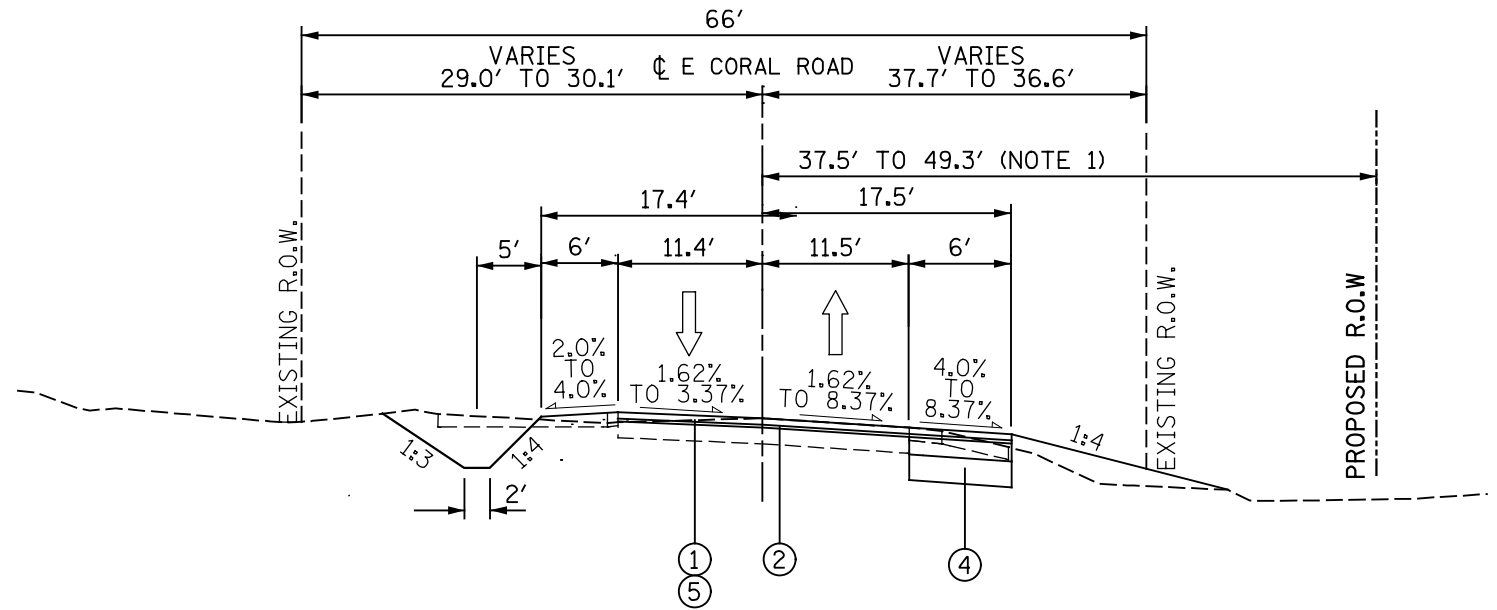
EXISTING TYPICAL SECTION  
CORAL ROAD  
STA. 108+47.78 TO STA. 110+01.57  
LOOKING EAST

EXISTING CONDITIONS

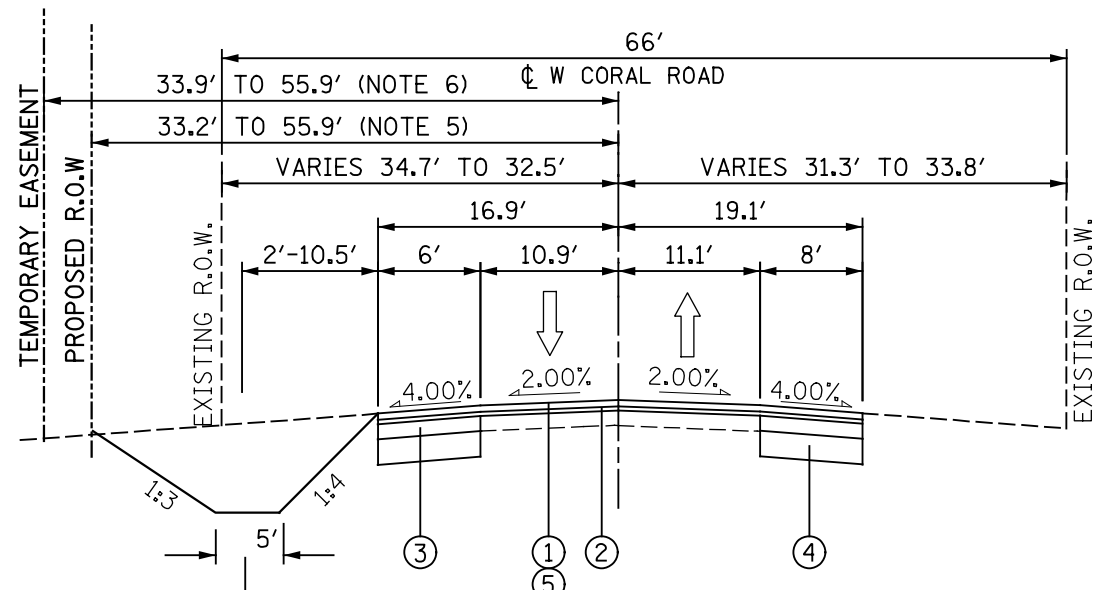
- (A) EXISTING HOT-MIX ASPHALT PAVEMENT, 8"±
- (B) EXISTING HOT-MIX ASPHALT PAVEMENT
- (C) EXISTING PCC BASE COURSE, 8"±
- (D) EXISTING HOT-MIX ASPHALT SHOULDER
- (E) EXISTING AGGREGATE SHOULDER

PROPOSED IMPROVEMENTS

- (1) PROPOSED POLYMERIZED HOT-MIX ASPHALT SURFACE COURSE, MIX "F", N90, 1 3/4"
- (2) PROPOSED POLYMERIZED LEVELING BINDER (MACHINE METHOD), IL-4.75 (MM), N50, 3/4"
- (3) PROPOSED HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N90, 8 3/4"
- (4) PROPOSED AGGREGATE SUBGRADE IMPROVEMENT, 12"
- (5) PROPOSED HOT-MIX ASPHALT SURFACE REMOVAL, 2 1/2"



PROPOSED TYPICAL SECTION  
EAST CORAL ROAD  
STA. 200+00.00 TO STA. 203+05.19  
LOOKING EAST



PROPOSED TYPICAL SECTION  
WEST CORAL ROAD  
STA. 108+47.78 TO STA. 110+01.57  
LOOKING EAST

- NOTE 1. PROPOSED ROW SECTION STA 200+33.4 TO STA 200+47.9  
NOTE 2. PROPOSED ROW SECTION STA 200+52.4 TO STA 200+71.9,  
NOTE 3. TEMPORARY EASEMENT STA 200+57.6 TO STA 200+71.9  
NOTE 4. DITCH SECTION STA 108+44.7 TO STA 109+34.4  
NOTE 5. PROPOSED ROW SECTION STA 109+31.9 TO STA 109+54.8  
NOTE 6. TEMPORARY EASEMENT SECTION STA 109+01.5 TO STA 109+54.8  
NOTE 7. PRPOSED DEPRESSED M-4.06 CURB AND GUTTER STA 200+83.24 TO STA 203+00

FILE NAME =	USER NAME = \$USER\$	DESIGNED - KH	REVISED - 03/05/2015
\$FILEL\$		DRAWN - KH	REVISED - 04/30/2015
	PLOT SCALE = \$SCALE\$	CHECKED - LSY	REVISED - 10/07/2015
\$MODELNAME\$	PLOT DATE = \$DATE\$	DATE - 12/19/2014	REVISED - 08/08/2016

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PLAN U.S. ROUTE 20 AND CORAL ROAD			
SCALE:	SHEET 4 OF 4 SHEETS	STA. 108+47.78 TO STA. 209+00.00	

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
525		MCHENRY	4	4
CONTRACT NO. 13587				
ILLINOIS FED. AID PROJECT				

**LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION****FULL-DEPTH HMA PAVEMENT**

Standard Design

ROUTE US 20  
SECTION 11-N-1  
COUNTY McHenry  
LOCATION at Marengo/Beck/S. Union Rd

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 4900 FT ==> 0.93 Miles  
# OF CENTERLINES 1 CL  
# OF LANES 2 LANES  
# OF EDGES 2 EP  
LANE WIDTH - AVERAGE 12 FT  
SHOULDER WIDTH HMA Left 10 FT  
HMA Right 10 FT  
Total Width of Paved Shoulders 20 FT

PAVEMENT THICKNESS (FLEXIBLE) 11.50 IN 14.25 IN MAX  
SHOULDER THICKNESS 8.00 IN Standard Design  
POLICY OVERLAY THICKNESS 2.25 IN

FLEX PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		3.17	8.18	8.18

HMA COST PER TON	UNIT PRICE
HMA SURFACE	\$86.51 / TON
HMA TOP BINDER	\$86.72 / TON
HMA LOWER BINDER	\$73.11 / TON
HMA BINDER (LEVELING)	\$103.67 / TON
HMA SHOULDER	\$72.00 / TON

INITIAL COSTS	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
HMA PAVEMENT ( FULL-DEPTH )	( 11.50" )	13,067	SQ YD	\$51.58 / SQ YD	\$673,979
HMA SURFACE COURSE	( 2.00" )	1,474	TONS	\$86.51 / TON	\$0
HMA TOP BINDER COURSE	( 2.25" )	1,682	TONS	\$86.72 / TON	\$0
HMA LOWER BINDER COURSE	( 7.25" )	5,595	TONS	\$73.11 / TON	\$0
HMA SHOULDER	( 8.00" )	4,878	TONS	\$72.00 / TON	\$351,232
CURB & GUTTER		0	LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C (TONS)		1,041	TONS	\$25.00 / TON	\$26,025
IMPROVED SUBGRADE: Aggregate		25,544	SQ YD	\$7.00 / SQ YD	\$178,808
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		13,067	SQ YD	\$15.00 / SQ YD	\$196,005
SHOULDER REMOVAL		10,889	SQ YD	\$10.00 / SQ YD	\$108,890

Note: \* Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST \$1,534,939  
FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE \$87,458

MAINTENANCE COSTS:	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF ( 2.00" )		Surface Mix	\$9.76 / SQ YD
HMA OVERLAY PVMT ( 2.25" )		Surface Mix	\$11.72 / SQ YD
HMA SURFACE MIX ( 1.50" )		Surface Mix	\$7.30 / SQ YD
HMA BINDER MIX ( 0.75" )		Binding Binder Mix	\$4.41 / SQ YD
HMA OVERLAY SHLD (Year 30) ( 2.25" )		Shoulder Mix	\$9.07 / SQ YD
HMA OVERLAY SHLD ( 2.00" )		Shoulder Mix	\$8.06 / SQ YD
MILLING (2.00 IN)			\$3.00 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill Surf)		Surface Mix	\$79.69 / SQ YD
PARTIAL DEPTH SHLD PATCH (Mill & Fill Surf)		Shoulder Mix	\$78.06 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill +2.00")		Leveling Binder Mix	\$81.61 / SQ YD
PARTIAL DEPTH SHLD PATCH (Mill & Fill +2.00")		Shoulder Mix	\$78.06 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL (100% Rehab = 110.00' / Station / Lane)			\$2.00 / LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST \$2,014,114  
FLEXIBLE TOTAL ANNUAL COST PER MILE \$88,516



FULL-DEPTH HMA PAVEMENT  
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT  
Figure 54-7.C  
STANDARD DESIGN

MAINTENANCE COSTS:		ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR	5							
		LONG SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
		CNTR LINE JOINT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
		RNDM / THRM CRACK R&S	50.00%	5,390	LIN FT	\$2.00	\$10,780	
		PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$79.69	\$1,036	
		PWF <sub>n</sub> =	0.8626		PW =	0.8626 X	\$41,216	\$35,553
YEAR	10							
		LONG SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
		CNTR LINE JOINT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
		RNDM / THRM CRACK R&S	50.00%	5,390	LIN FT	\$2.00	\$10,780	
		PD PVMT PATCH M&F SURF	0.50%	65	SQ YD	\$79.69	\$5,180	
		PWF <sub>n</sub> =	0.7441		PW =	0.7441 X	\$45,360	\$33,752
YEAR	15							
		MILL PVMT & SHLD 2.00"	100.00%	23,956	SQ YD	\$3.00	\$71,868	
		PD PVMT PATCH M&F ADD'L 2.00"	1.00%	131	SQ YD	\$81.61	\$10,691	
		HMA OVERLAY PVMT 2.00"	100.00%	13,067	SQ YD	\$9.76	\$127,484	
		HMA OVERLAY SHLD 2.00 "	100.00%	10,889	SQ YD	\$8.06	\$87,808	
		PWF <sub>n</sub> =	0.6419		PW =	0.6419 X	\$297,851	\$191,179
YEAR	20							
		LONG SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
		CNTR LINE JOINT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
		RNDM / THRM CRACK R&S	50.00%	5,390	LIN FT	\$2.00	\$10,780	
		PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$79.69	\$1,036	
		PWF <sub>n</sub> =	0.5537		PW =	0.5537 X	\$41,216	\$22,820
YEAR	25							
		LONG SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
		CNTR LINE JOINT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
		RNDM / THRM CRACK R&S	50.00%	5,390	LIN FT	\$2.00	\$10,780	
		PD PVMT PATCH M&F SURF	0.50%	65	SQ YD	\$79.69	\$5,180	
		PWF <sub>n</sub> =	0.4776		PW =	0.4776 X	\$45,360	\$21,664
		HMA SD						
YEAR	30							
		NON-INTERSTATE						
		MILL PVMT & SHLD 2.00"	100.00%	23,956	SQ YD	\$3.00	\$71,868	
		PD PVMT PATCH M&F ADD'L 2.00"	2.00%	261	SQ YD	\$81.61	\$21,300	
		PD SHLD PATCH M&F ADD'L 2.00"	1.00%	109	SQ YD	\$78.06	\$8,509	
		HMA OVERLAY PVMT 2.25 "	100.00%	13,067	SQ YD	\$11.72	\$153,083	
		HMA OVERLAY SHLD 2.25 "	100.00%	10,889	SQ YD	\$9.07	\$98,784	
		PWF <sub>n</sub> =	0.4120		PW =	0.4120 X	\$353,544	\$145,655
YEAR	35							
		LONG SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
		CNTR LINE JOINT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
		RNDM / THRM CRACK R&S	50.00%	5,390	LIN FT	\$2.00	\$10,780	
		PD PVMT PATCH M&F SURF	0.10%	13	SQ YD	\$79.69	\$1,036	
		PWF <sub>n</sub> =	0.3554		PW =	0.3554 X	\$41,216	\$14,647
YEAR	40							
		LONG SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
		CNTR LINE JOINT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
		RNDM / THRM CRACK R&S	50.00%	5,390	LIN FT	\$2.00	\$10,780	
		PD PVMT PATCH M&F SURF	0.50%	65	SQ YD	\$79.69	\$5,180	
		PWF <sub>n</sub> =	0.3066		PW =	0.3066 X	\$45,360	\$13,905
								\$479,175
ROUTINE MAINTENANCE ACTIVITY					1.86 Lane Miles:	0.00	\$0	\$0
					MAINTENANCE LIFE-CYCLE COST			\$479,175
45 YEAR LIFE CYCLE					MAINTENANCE ANNUAL COST PER MILE			\$21,059
CRFn = 0.0407852								

**PCC PAVEMENT****JPCP**

ROUTE US 20  
 SECTION 11-N-1  
 COUNTY McHenry  
 LOCATION at Marengo/Beck/S. Union Rd

FACILITY TYPE NON-INTERSTATE

PROJECT LENGTH 4900 FT ==> 0.93 Miles  
 # OF CENTERLINES 1 CL  
 # OF LANES 2 LANES  
 # OF EDGES 2 EP  
 LANE WIDTH - AVERAGE 12 FT  
 SHOULDER WIDTH PCC Left 10 FT  
 PCC Right 10 FT  
 Total Width of Paved Shoulders 20 FT

PAVEMENT THICKNESS (RIGID) JPCP 10.25 IN TIED SHLD  
 SHOULDER THICKNESS 10.25 IN

POLICY OVERLAY THICKNESS 2.50 IN

RIGID PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
Worksheet Construction Type is	Reconstruction	4.59	11.79	11.79
				JPCP

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	( 10.25" )	13,067	SQ YD	\$66.43 / SQ YD	\$868,041
PAVEMENT REINFORCEMENT		0	SQ YD	\$22.00 / SQ YD	\$0
STABILIZED SUBBASE	( 4.00" )	14,700	SQ YD	\$19.00 / SQ YD	\$279,300
PCC SHOULDERS		10,889	SQ YD	\$40.00 / SQ YD	\$435,560
CURB & GUTTER		0	LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C	( 2-1.00" )	1,187	TONS	\$25.00 / TON	\$29,675
IMPROVED SUBGRADE:	Aggregate	24,500	SQ YD	\$7.00 / SQ YD	\$171,500
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		13,067	SQ YD	\$15.00 / SQ YD	\$196,005
SHOULDER REMOVAL		10,889	SQ YD	\$10.00 / SQ YD	\$108,890

Note: \* Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST	\$2,088,971
RIGID CONSTRUCTION ANNUAL COST PER MILE	\$91,806

**MAINTENANCE COSTS:**

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY \$0.00 / LANE-MILE / YEAR			
HMA POLICY OVERLAY	( 2.50" )		
HMA POLICY OVERLAY PVMT	( 2.50" )	Surface Mix	\$13.19 / SQ YD
HMA SURFACE MIX	( 1.50" )	Surface Mix	\$7.30 / SQ YD
HMA BINDER MIX	( 1.00" )	Sliding Binder Mix	\$5.89 / SQ YD
HMA POLICY OVERLAY SHLD	( 2.50" )	Shoulder Mix	\$10.08 / SQ YD
CLASS A PAVEMENT PATCHING			\$195.00 / SQ YD
CLASS B PAVEMENT PATCHING			\$150.00 / SQ YD
CLASS C SHOULDER PATCHING			\$145.00 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)		Surface Mix	\$77.27 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	\$82.11 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL			\$2.00 / LIN FT
RANDOM CRACK ROUT & SEAL (100% Rehab = 100.00' / Station / Lane)			\$2.00 / LIN FT

RIGID TOTAL LIFE-CYCLE COST	\$2,365,204
RIGID TOTAL ANNUAL COST PER MILE	\$103,946



JOINTED PLAIN CONCRETE PAVEMENT  
UNBONDED JOINTED PLAIN CONCRETE OVERLAY  
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 10	PAVEMENT PATCH CLASS B	0.10%	13	SQ YD	\$150.00	\$1,950	
	PWF <sub>n</sub> = 0.7441			PW = 0.7441 X		\$1,950	\$1,451
YEAR 15	PAVEMENT PATCH CLASS B	0.20%	26	SQ YD	\$150.00	\$3,900	
	PWF <sub>n</sub> = 0.6419			PW = 0.6419 X		\$3,900	\$2,503
YEAR 20	PAVEMENT PATCH CLASS B	2.00%	261	SQ YD	\$150.00	\$39,150	
	SHOULDER PATCH CLASS C	0.50%	54	SQ YD	\$145.00	\$7,830	
	LONGITUDINAL SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
	CENTERLINE JT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
	PWF <sub>n</sub> = 0.5537			PW = 0.5537 X		\$76,380	\$42,290
YEAR 25	PAVEMENT PATCH CLASS B	3.00%	392	SQ YD	\$150.00	\$58,800	
	SHOULDER PATCH CLASS C	1.00%	109	SQ YD	\$145.00	\$15,805	
	PWF <sub>n</sub> = 0.4776			PW = 0.4776 X		\$74,605	\$35,632
YEAR 30	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	4.00%	523	SQ YD	\$150.00	\$78,450	
	SHOULDER PATCH CLASS C	1.50%	163	SQ YD	\$145.00	\$23,635	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	13,067	SQ YD	\$13.19	\$172,360	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	10,889	SQ YD	\$10.08	\$109,760	
	PWF <sub>n</sub> = 0.4120			PW = 0.4120 X		\$384,205	\$158,287
YEAR 35	NON-INTERSTATE						
	LONGITUDINAL SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
	CENTERLINE JT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
	RANDOM CRACK R&S	50.00%	4,900	LIN FT	\$2.00	\$9,800	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	3,139	LIN FT	\$2.00	\$6,278	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	13	SQ YD	\$82.11	\$1,067	
	PWF <sub>n</sub> = 0.3554			PW = 0.3554 X		\$46,545	\$16,541
YEAR 40	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	0.50%	65	SQ YD	\$150.00	\$9,750	
	LONGITUDINAL SHLD JT R&S	100.00%	9,800	LIN FT	\$2.00	\$19,600	
	CENTERLINE JT R&S	100.00%	4,900	LIN FT	\$2.00	\$9,800	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	4,709	LIN FT	\$2.00	\$9,418	
	RANDOM CRACK R&S	50.00%	4,900	LIN FT	\$2.00	\$9,800	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	65	SQ YD	\$82.11	\$5,337	
	PWF <sub>n</sub> = 0.3066			PW = 0.3066 X		\$63,705	\$19,529
							\$276,233
	ROUTINE MAINTENANCE ACTIVITY		1.86	Lane Miles	\$0.00	\$0	\$0
							MAINTENANCE LIFE-CYCLE COST \$276,233
45	YEAR LIFE CYCLE	CRF <sub>n</sub> = 0.0407852					MAINTENANCE ANNUAL COST PER MILE \$12,140

## LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 1/18/18 10:32 AM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	\$2,088,971	\$1,534,939
		ANNUAL COST PER MILE	\$91,806	\$67,458
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	\$276,233	\$479,175
		ANNUAL COST PER MILE	\$12,140	\$21,059
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	\$2,365,204	\$2,014,114
		ANNUAL COST PER MILE	\$103,946	\$88,516

## LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	=====>	HMA	\$88,516	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	JPCP	\$103,946	17.4%

S:\GEN\WPD\CS\Pavement Designs\ID-1\US 20 - Marengo Rd to S Union Rd - 62D36\US 20 (RAB)-IDOT Mech Pvmt Dgn LCCA 09-05-13.xlsm]LifeCycleCost

**LIFE-CYCLE COST ANALYSIS: NEW CONSTRUCTION / RECONSTRUCTION****FULL-DEPTH HMA PAVEMENT**

Standard Design

ROUTE **Marengo Road/Beck Road**  
 SECTION **11-N-1**  
 COUNTY **McHenry**  
 LOCATION **at US 20**

FACILITY TYPE **NON-INTERSTATE**

PROJECT LENGTH **800 FT ==> 0.15 Miles**  
 # OF CENTERLINES **1 CL**  
 # OF LANES **2 LANES**  
 # OF EDGES **2 EP**  
 LANE WIDTH - AVERAGE **12 FT**  
 SHOULDER WIDTH **10 FT**  
 HMA Left  
 HMA Right  
 Total Width of Paved Shoulders **20 FT**

PAVEMENT THICKNESS (FLEXIBLE) **9.75 IN 14.25 IN MAX**  
 SHOULDER THICKNESS **8.00 IN Standard Design**  
 POLICY OVERLAY THICKNESS **2.25 IN**

FLEX PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		3.17	0.67	3.17

HMA COST PER TON	UNIT PRICE
HMA SURFACE	\$161.47 / TON
HMA TOP BINDER	\$75.62 / TON
HMA LOWER BINDER	\$75.62 / TON
HMA BINDER (LEVELING)	\$85.00 / TON
HMA SHOULDER	\$72.00 / TON

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY UNIT	UNIT PRICE	COST
HMA PAVEMENT (FULL-DEPTH)	(9.75")	2,133 SQ YD	\$51.58 / SQ YD	\$110,037
HMA SURFACE COURSE	(2.00")	241 TONS	\$161.47 / TON	\$0
HMA TOP BINDER COURSE	(2.25")	275 TONS	\$75.62 / TON	\$0
HMA LOWER BINDER COURSE	(5.50")	689 TONS	\$75.62 / TON	\$0
HMA SHOULDER	(8.00")	796 TONS	\$72.00 / TON	\$57,344
CURB & GUTTER		0 LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C (TONS)		0 TONS	\$25.00 / TON	\$0
IMPROVED SUBGRADE	Aggregate	4,144 SQ YD	\$7.00 / SQ YD	\$29,008
Reserved For User Supplied Item		0 UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0 UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		2,133 SQ YD	\$15.00 / SQ YD	\$31,995
SHOULDER REMOVAL		1,778 SQ YD	\$10.00 / SQ YD	\$17,780

Note: \* Denotes User Supplied Quantity

FLEXIBLE CONSTRUCTION INITIAL COST \$246,164  
 FLEXIBLE CONSTRUCTION ANNUAL COST PER MILE \$66,263

**MAINTENANCE COSTS:**

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY			\$0.00 LANE-MILE / YEAR
HMA OVERLAY PVMT SURF	(2.00")	Surface Mix	\$18.21 / SQ YD
HMA OVERLAY PVMT	(2.25")	Surface Mix	\$17.25 / SQ YD
HMA SURFACE MIX	(1.50")	Surface Mix	\$13.63 / SQ YD
HMA BINDER MIX	(0.75")	Binding Binder Mix	\$3.62 / SQ YD
HMA OVERLAY SHLD (Year 30)	(2.25")	Shoulder Mix	\$9.07 / SQ YD
HMA OVERLAY SHLD	(2.00")	Shoulder Mix	\$8.06 / SQ YD
MILLING (2.00 IN)			\$3.00 / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill Surf)	Surface Mix	\$88.08 / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill Surf)	Shoulder Mix	\$78.06 / SQ YD
PARTIAL DEPTH PVMT PATCH	(Mill & Fill +2.00")	Leveling Binder Mix	\$79.52 / SQ YD
PARTIAL DEPTH SHLD PATCH	(Mill & Fill +2.00")	Shoulder Mix	\$78.06 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
RANDOM / THERMAL CRACK ROUT & SEAL	(100% Rehab = 110.00' / Station / Lane)		\$2.00 / LIN FT

FLEXIBLE TOTAL LIFE-CYCLE COST \$340,972  
 FLEXIBLE TOTAL ANNUAL COST PER MILE \$91,784



MAINTENANCE AND REHABILITATION ACTIVITY SCHEDULE

03/16/18

FULL-DEPTH HMA PAVEMENT  
HMA OVERLAY OF RUBBLIZED PCC PAVEMENT  
Figure 54-7.C  
STANDARD DESIGN

MAINTENANCE COSTS: ITEM % QUANTITY UNIT UNIT COST COST PRESENT WORTH

YEAR 5							
	LONG SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CNTR LINE JOINT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RNDM / THRM CRACK R&S	50.00%	880	LIN FT	\$2.00	\$1,760	
	PD PVMT PATCH M&F SURF	0.10%	2	SQ YD	\$88.08	\$176	
	PWFn =	0.8626		PW =	0.8626 X	\$6,736	\$5,811

YEAR 10							
	LONG SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CNTR LINE JOINT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RNDM / THRM CRACK R&S	50.00%	880	LIN FT	\$2.00	\$1,760	
	PD PVMT PATCH M&F SURF	0.50%	11	SQ YD	\$88.08	\$969	
	PWFn =	0.7441		PW =	0.7441 X	\$7,529	\$5,602

YEAR 15							
	MILL PVMT & SHLD 2.00"	100.00%	3,911	SQ YD	\$3.00	\$11,733	
	PD PVMT PATCH M&F ADD'L 2.00"	1.00%	21	SQ YD	\$79.52	\$1,670	
	HMA OVERLAY PVMT 2.00"	100.00%	2,133	SQ YD	\$18.21	\$38,848	
	HMA OVERLAY SHLD 2.00 "	100.00%	1,778	SQ YD	\$8.06	\$14,336	
	PWFn =	0.6419		PW =	0.6419 X	\$66,587	\$42,740

YEAR 20							
	LONG SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CNTR LINE JOINT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RNDM / THRM CRACK R&S	50.00%	880	LIN FT	\$2.00	\$1,760	
	PD PVMT PATCH M&F SURF	0.10%	2	SQ YD	\$88.08	\$176	
	PWFn =	0.5537		PW =	0.5537 X	\$6,736	\$3,730

YEAR 25							
	LONG SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CNTR LINE JOINT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RNDM / THRM CRACK R&S	50.00%	880	LIN FT	\$2.00	\$1,760	
	PD PVMT PATCH M&F SURF	0.50%	11	SQ YD	\$88.08	\$969	
	PWFn =	0.4776		PW =	0.4776 X	\$7,529	\$3,596

	HMA_SD						
YEAR 30	NON-INTERSTATE						
	MILL PVMT & SHLD 2.00"	100.00%	3,911	SQ YD	\$3.00	\$11,733	
	PD PVMT PATCH M&F ADD'L 2.00"	2.00%	43	SQ YD	\$79.52	\$3,419	
	PD SHLD PATCH M&F ADD'L 2.00"	1.00%	18	SQ YD	\$78.06	\$1,405	
	HMA OVERLAY PVMT 2.25 "	100.00%	2,133	SQ YD	\$17.25	\$36,801	
	HMA OVERLAY SHLD 2.25 "	100.00%	1,778	SQ YD	\$9.07	\$16,128	
	PWFn =	0.4120		PW =	0.4120 X	\$69,486	\$28,627

YEAR 35							
	LONG SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CNTR LINE JOINT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RNDM / THRM CRACK R&S	50.00%	880	LIN FT	\$2.00	\$1,760	
	PD PVMT PATCH M&F SURF	0.10%	2	SQ YD	\$88.08	\$176	
	PWFn =	0.3554		PW =	0.3554 X	\$6,736	\$2,394

YEAR 40							
	LONG SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CNTR LINE JOINT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RNDM / THRM CRACK R&S	50.00%	880	LIN FT	\$2.00	\$1,760	
	PD PVMT PATCH M&F SURF	0.50%	11	SQ YD	\$88.08	\$969	
	PWFn =	0.3066		PW =	0.3066 X	\$7,529	\$2,308

\$94,808

ROUTINE MAINTENANCE ACTIVITY 0.30 Lane Miles 0.00 \$0 \$0

45 YEAR LIFE CYCLE CRFn = 0.0407852 MAINTENANCE LIFE-CYCLE COST \$94,808  
MAINTENANCE ANNUAL COST PER MILE \$25,521

**PCC PAVEMENT****JPCP**

ROUTE **Marengo Road/Beck Road**  
 SECTION **11-N-1**  
 COUNTY **McHenry**  
 LOCATION **at US 20**

FACILITY TYPE **NON-INTERSTATE**

PROJECT LENGTH **800 FT == > 0.15 Miles**  
 # OF CENTERLINES **1 CL**  
 # OF LANES **2 LANES**  
 # OF EDGES **2 EP**  
 LANE WIDTH - AVERAGE **12 FT**  
 SHOULDER WIDTH **10 FT**  
 PCC Left **10 FT**  
 PCC Right **10 FT**  
 Total Width of Paved Shoulders **20 FT**

PAVEMENT THICKNESS (RIGID) **JPCP 9.00 IN TIED SHLD**  
 SHOULDER THICKNESS **9.00 IN**

POLICY OVERLAY THICKNESS **2.50 IN**

RIGID PAVEMENT	TRAFFIC FACTORS	MINIMUM	ACTUAL	USE
		<b>4.59</b>	<b>0.92</b>	<b>4.59</b>
Worksheet Construction Type is	Reconstruction	The Pavement Type is		<b>JPCP</b>

**INITIAL COSTS**

ITEM	THICKNESS	100% QUANTITY	UNIT	UNIT PRICE	COST
JPC PAVEMENT	( 9.00" )	2,133	SQ YD	\$72.54 / SQ YD	\$154,728
PAVEMENT REINFORCEMENT		0	SQ YD	\$22.00 / SQ YD	\$0
STABILIZED SUBBASE	( 4.00" )	2,400	SQ YD	\$19.00 / SQ YD	\$45,600
PCC SHOULDERS		1,778	SQ YD	\$40.00 / SQ YD	\$71,120
CURB & GUTTER		0	LIN FT	\$30.00 / LIN FT	\$0
SUBBASE GRAN MATL TY C		194	TONS	\$25.00 / TON	\$4,850
IMPROVED SUBGRADE:	Aggregate	4,000	SQ YD	\$7.00 / SQ YD	\$28,000
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
Reserved For User Supplied Item		0	UNITS	\$0.00 / UNITS	\$0
PAVEMENT REMOVAL		2,133	SQ YD	\$15.00 / SQ YD	\$31,995
SHOULDER REMOVAL		1,778	SQ YD	\$10.00 / SQ YD	\$17,780

Note: \* Denotes User Supplied Quantity

RIGID CONSTRUCTION INITIAL COST **\$354,073**  
 RIGID CONSTRUCTION ANNUAL COST PER MILE **\$95,310**

**MAINTENANCE COSTS:**

ITEM	THICKNESS	MATERIAL	UNIT COST
ROUTINE MAINTENANCE ACTIVITY <b>\$0.00 / LANE-MILE / YEAR</b>			
HMA POLICY OVERLAY	( 2.50" )		
HMA POLICY OVERLAY PVMT	( 2.50" )		\$18.46 / SQ YD
HMA SURFACE MIX	( 1.50" )	Surface Mix	\$13.63 / SQ YD
HMA BINDER MIX	( 1.00" )	Sliding Binder Mix	\$4.83 / SQ YD
HMA POLICY OVERLAY SHLD	( 2.50" )	Shoulder Mix	\$10.08 / SQ YD
CLASS A PAVEMENT PATCHING			\$195.00 / SQ YD
CLASS B PAVEMENT PATCHING			\$150.00 / SQ YD
CLASS C SHOULDER PATCHING			\$145.00 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA Surf)		Surface Mix	\$83.56 / SQ YD
PARTIAL DEPTH PVMT PATCH (Mill & Fill HMA 2.50")		Surface Mix	\$92.61 / SQ YD
LONGITUDINAL SHOULDER JOINT ROUT & SEAL			\$2.00 / LIN FT
CENTERLINE JOINT ROUT & SEAL			\$2.00 / LIN FT
REFLECTIVE TRANSVERSE CRACK ROUT & SEAL			\$2.00 / LIN FT
RANDOM CRACK ROUT & SEAL	(100% Rehab = 100.00' / Station / Lane)		\$2.00 / LIN FT

RIGID TOTAL LIFE-CYCLE COST **\$403,887**  
 RIGID TOTAL ANNUAL COST PER MILE **\$108,719**



JOINTED PLAIN CONCRETE PAVEMENT  
UNBONDED JOINTED PLAIN CONCRETE OVERLAY  
Figure 54-7.A

MAINTENANCE COSTS:	ITEM	%	QUANTITY	UNIT	UNIT COST	COST	PRESENT WORTH
YEAR 10	PAVEMENT PATCH CLASS B	0.10%	2	SQ YD	\$150.00	\$300	
	PWFn = 0.7441			PW = 0.7441 X		\$300	\$223
YEAR 15	PAVEMENT PATCH CLASS B	0.20%	4	SQ YD	\$150.00	\$600	
	PWFn = 0.6419			PW = 0.6419 X		\$600	\$385
YEAR 20	PAVEMENT PATCH CLASS B	2.00%	43	SQ YD	\$150.00	\$6,450	
	SHOULDER PATCH CLASS C	0.50%	9	SQ YD	\$145.00	\$1,305	
	LONGITUDINAL SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CENTERLINE JT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	PWFn = 0.5537			PW = 0.5537 X		\$12,555	\$6,951
YEAR 25	PAVEMENT PATCH CLASS B	3.00%	64	SQ YD	\$150.00	\$9,600	
	SHOULDER PATCH CLASS C	1.00%	18	SQ YD	\$145.00	\$2,610	
	PWFn = 0.4776			PW = 0.4776 X		\$12,210	\$5,832
YEAR 30	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	4.00%	85	SQ YD	\$150.00	\$12,750	
	SHOULDER PATCH CLASS C	1.50%	27	SQ YD	\$145.00	\$3,915	
	HMA POLICY OVERLAY 2.5" (PVMT)	100.00%	2,133	SQ YD	\$18.46	\$39,382	
	HMA POLICY OVERLAY 2.5" (SHLD)	100.00%	1,778	SQ YD	\$10.08	\$17,920	
	PWFn = 0.4120			PW = 0.4120 X		\$73,967	\$30,473
YEAR 35	NON-INTERSTATE						
	LONGITUDINAL SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CENTERLINE JT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	RANDOM CRACK R&S	50.00%	800	LIN FT	\$2.00	\$1,600	
	REFLECTIVE TRANSVERSE CRACK R&S	40.00%	509	LIN FT	\$2.00	\$1,018	
	PD PVMT PATCH M&F HMA 2.50"	0.10%	2	SQ YD	\$92.61	\$185	
	PWFn = 0.3554			PW = 0.3554 X		\$7,603	\$2,702
YEAR 40	NON-INTERSTATE						
	PAVEMENT PATCH CLASS B	0.50%	11	SQ YD	\$150.00	\$1,650	
	LONGITUDINAL SHLD JT R&S	100.00%	1,600	LIN FT	\$2.00	\$3,200	
	CENTERLINE JT R&S	100.00%	800	LIN FT	\$2.00	\$1,600	
	REFLECTIVE TRANSVERSE CRACK R&S	60.00%	763	LIN FT	\$2.00	\$1,526	
	RANDOM CRACK R&S	50.00%	800	LIN FT	\$2.00	\$1,600	
	PD PVMT PATCH M&F HMA 2.50"	0.50%	11	SQ YD	\$92.61	\$1,019	
	PWFn = 0.3066			PW = 0.3066 X		\$10,595	\$3,248
							\$49,814
	ROUTINE MAINTENANCE ACTIVITY		0.30	Lane Miles	\$0.00	\$0	\$0
							MAINTENANCE LIFE-CYCLE COST \$49,814
45	YEAR LIFE CYCLE	CRFn = 0.0407852					MAINTENANCE ANNUAL COST PER MILE \$13,409

## LIFE-CYCLE COST ANALYSIS: NEW DESIGN

Calculated / Revised : 1/18/18 1:35 PM

			JPCP	HMA
CONSTRUCTION	INITIAL COST	PRESENT WORTH	\$354,073	\$246,164
		ANNUAL COST PER MILE	\$95,310	\$66,263
MAINTENANCE	LIFE-CYCLE COST	PRESENT WORTH	\$49,814	\$94,808
		ANNUAL COST PER MILE	\$13,409	\$25,521
TOTAL	LIFE-CYCLE COST	PRESENT WORTH	\$403,887	\$340,972
		ANNUAL COST PER MILE	\$108,719	\$91,784

## LIFE-CYCLE COST ANALYSIS: FINAL SUMMARY

LOWEST COST OPTION	=====>	HMA	\$91,784	
OTHER OPTIONS (LOWEST TO HIGHEST):	TYPE / PERCENTAGE	JPCP	\$108,719	18.5%

S:\GEN\WPDOCS\Pavement Designs\ID-1\US 20 - Marengo Rd to S Union Rd - 62D36\Marengo and Beck Rds - approach to US 20 - IDOT Mech Pvmt Dgn LCCA 09